THE JOURNAL OF GAS LIGHTING
WATER SUPPLY & SANITARY IMPROVEMENT

VOL. LXIV. No. 1639.] LONDON, OCTOBER 9, 1894. [46TH YEAR. PRICE 6d.

JAMES OAKES & Co.,
ALFRETON IRON-WORKS, DERBYSHIRE,
AND
Wenlock Iron Wharf, 21 & 22, Wharf Road,
CITY ROAD, LONDON, N.,

Manufacture and keep in Stock at their Works (also large stock in London)

PIPES and CONNECTIONS, 1½ to 48 inches in diameter, and make and erect to order RETORTS, PURIFIERS and TANKS, with or without planed joints, COLUMNS, GIRDERS, SPECIAL CASTINGS, &c., required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

NOTE. — Makers of HORSLEY'S PATENT SYPHONS. These are cast in one piece, without Chaplets; doing away with bolts, nuts and covers, and rendering leakage impossible.

WOLSTON'S TORBAY PAINTS
Special Quotations to Gas Companies.
DARTMOUTH, DEVON.

Lanemark Coal Co.,
LIMITED.
LANEMARK CANNEL AND GAS COALS.
Quotations and Analysis on application to
LANEMARK COLLIERY,
NEW CUMNOCK, N.B.
Shipping Ports: All the principal Scotch Ports.

— ESTABLISHED 1830. —
PARKER & LESTER,
Manufacturers & Contractors.
THE ONLY MAKERS OF
PATENT ANTIMONY PAINT,
Parker's Imperial Black Varnish,
Oxide Paints, Oils, and General Stores for Gas and Water Works.
WORKS:
ORMSIDE STREET, OLD KENT ROAD, LONDON.

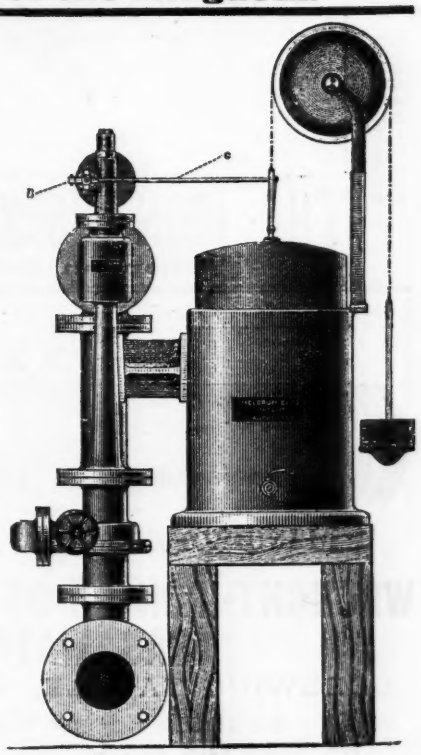
Ashmore, Benson, Pease, & Co., Ld.,
STOCKTON-ON-TEES,
Manufacturing Gas Engineers.
See Advt. p. 680 of this week's issue.

INCLINED RETORTS,
FIRE BRICKS,
LUMPS, TILES,
BLOCKS, &c.
Special Bricks for Intense Heats.

GAS RETORTS.

CASTINGS AND EVERY REQUISITE FOR GAS-WORKS.
MOBBERLEY & PERRY,
Fire-Brick Works, STOURBRIDGE.
☞ Retort Setters sent to any part of the Kingdom.

MELDRUM'S Patent
Gas EXHAUSTER & GOVERNOR.
ABSOLUTELY AUTOMATIC.
REQUIRES NO ATTENTION WHATEVER.
Guaranteed perfectly steady Gauge, no matter how Steam Pressure may vary.
— HIGHEST REFERENCES GIVEN. —
MELDRUM BROS., Atlantic Works, City Road,
MANCHESTER.



Telegrams: "MELDRUM, MANCHESTER." National Telephone: No. 1674.

DANIEL HOWARD,

(Successor to the late BENJ. WHITEHOUSE),

GASHOLDER & BOILER WORKS,

WEST BROMWICH, NEAR BIRMINGHAM

(ESTABLISHED 1765),

MANUFACTURER OF TELESCOPIC AND SINGLE GASHOLDERS,

WROUGHT AND CAST IRON TANKS FOR DITTO,

PURIFIERS, CONDENSERS, SCRUBBERS, HYDRAULIC MAINS, and all kinds of GAS APPARATUS,

Wrought-Iron Roofs, Bridges, Girders, &c.,

Steam, Hot Water, and Range Boilers, Tanks, Cisterns, Boats, and all kinds of Wrought-Iron Work.

DRAWINGS, SPECIFICATIONS, AND ESTIMATES SUPPLIED ON APPLICATION.

EDWARD COCKEY & SONS, LIMITED,

ENGINEERS & CONTRACTORS FOR GAS-WORKS,

MAKERS OF FISH AND SMITH'S PATENT (NO. 5108) OVERFLOWS FOR REGULATING THE SEAL IN GAS-WASHERS, &c.

TELEGRAPHIC ADDRESS: "COCKEYS FROME."

Improved Dry-Faced Centre Valves for Working either One, Two, Three, or Four Purifiers at one time; giving an increase of Purifying Area above that obtainable with ordinary Centre Valves of 33⅓ per Cent.

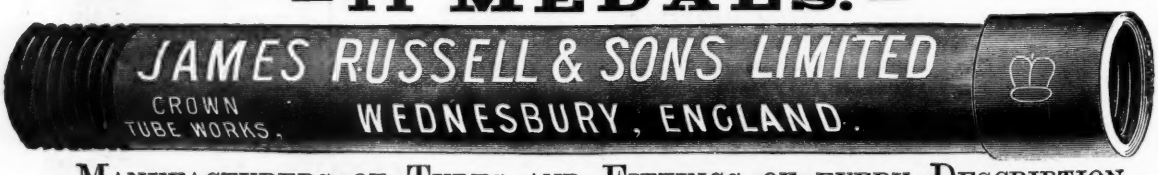
PRICES ON APPLICATION TO THE SOLE MAKERS.

THE IRON-WORKS, FROME SELWOOD, SOMERSET.

London Office: 22, COLEMAN STREET, E.C.

HIGHEST AWARDS—LONDON, PARIS, COLOGNE, VIENNA, MELBOURNE, AND OTHERS.

—11 MEDALS.—



MANUFACTURERS OF TUBES AND FITTINGS OF EVERY DESCRIPTION.

WROUGHT-IRON OR STEEL MAINS UP TO 6 FEET DIAMETER, FOR GAS, WATER, OIL, OR OTHER PURPOSES.

SCREWING TACKLE, BOILER MOUNTINGS, VALVES, COCKS, ETC.

LONDON: 108, Southwark Street.

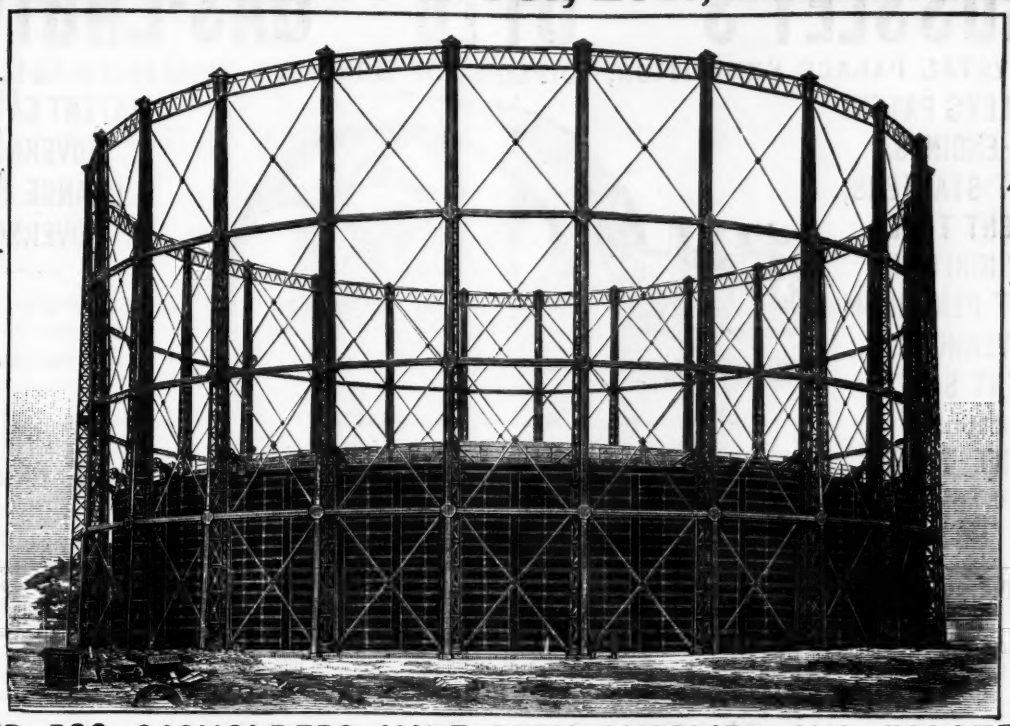
BIRMINGHAM: 114, Colmore Row.

LEEDS: 6, Mark Lane, New Briggate.

THOMAS PIGGOTT & CO., LTD., BIRMINGHAM.

LONDON OFFICE: ST. THOMAS APOSTLE, E.C.

GAS PLANTS, BOILERS, ENGINES, PUMPS, ROOFS, RETORT FITTINGS, ETC.



TELEGRAPHIC ADDRESS: ATLAS, BIRMINGHAM.

WELDED & RIVETED PIPES, FOUL MAINS, RETORT LIDS, WROT & CAST TANKS, PURIFIERS.

OVER 500 GASHOLDERS HAVE BEEN SUPPLIED AND ERECTED,

INCLUDING THOSE SUPPLIED TO THE FOLLOWING GAS COMPANIES AND CORPORATIONS:

BATH.	BOLTON.	BRISTOL.	CHELTENHAM.	LEAMINGTON.	PRESTON.	SHEFFIELD.
BELFAST.	BOMBAY.	BRISBANE.	HARTLEPOOL.	LIVERPOOL.	READING.	STOCKHOLM.
BECKTON.	BRADFORD.	CARDIFF.	LEEDS.	NOTTINGHAM.	RIO GRANDE.	SYDNEY.
BIRMINGHAM.	BRIGHTON.	COVENTRY.	LEICESTER.	OLDHAM.	SOUTH METRON	VIENNA.

GAS COAL.

BEST

REAL OLD SILKSTONE GAS COAL,

Address THE STRAFFORD COLLIERIES COMPANY,

Near BARNSLEY, SOUTH YORKSHIRE.

NEWTON, CHAMBERS, & CO., LIMITED,

THORNCLIFFE IRON-WORKS, near SHEFFIELD,

MANUFACTURERS OF

SLIDE VALVES, WITH RACK & PINION OR Internal or External SCREWS of all sizes.

GASHOLDERS, AND Gasholder Tanks.

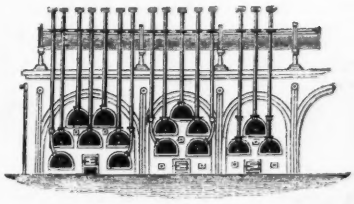
CAST-IRON RETORTS,

RETORT-BED FITTINGS,

And Retort-House Appliances

of every description,

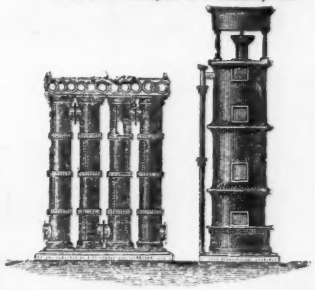
Iron Roofs, Columns, Girders, Floor Plates and Tools, &c.



WROUGHT AND CAST IRON

CONDENSERS, SCRUBBERS, & WASHERS,

TAR AND LIQUOR PUMPS, &c.



PATENT

CENTRE-VALVES

for working Purifiers,

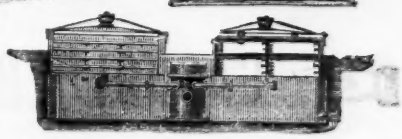
Also Bye-Pass & Stop Valves.

PURIFIERS with Planed Joints,

HAND and HYDRAULIC LIFTING GEAR, CAST-IRON MAINS and SPECIALS.

WOOD GRIDS.

CAST AND WROUGHT IRON TANKS AND CISTERNS.



DESIGNS, SPECIFICATIONS, AND ESTIMATES FREE.

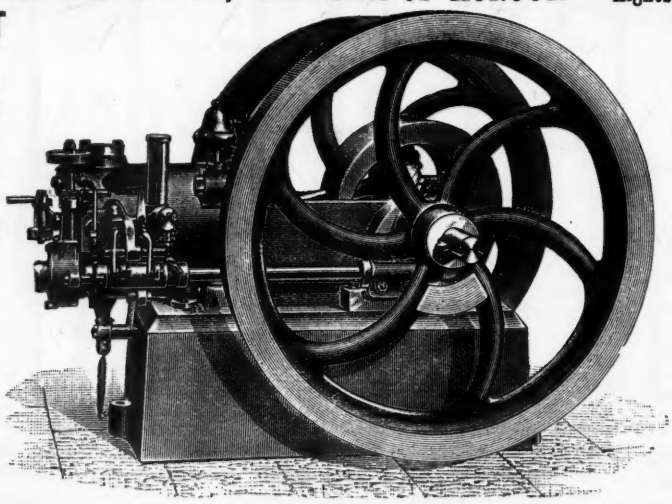
Pig Iron (*Special Quality*) for ENGINE CYLINDERS, &c.

GAS COAL FAMOUS FOR ITS UNRIVALLED EXCELLENCE.

CROSSLEY'S "OTTO" GAS-ENGINE.

CRYSTAL PALACE EXHIBITION, "DIPLOMA OF HONOUR"—Highest Award to Gas-Engines.

CROSSLEY'S PATENT OIL-ENGINES, PATENT STARTERS, PATENT TUBES FOR IGNITION, PATENT PENDULUM GOVERNORS, PATENT SAFETY HANDLES, PATENT TIMERS, PATENT ANTI-FLUCTUATING GAS-BAGS.



PATENT CATARACT GOVERNORS, CHANGE SPEED GOVERNORS.

Every Engine thoroughly tested before being sent out

ALL PARTS MADE STRICTLY TO GAUGE

GREAT REDUCTION IN PRICES.

OVER 800 ENGINES ALWAYS IN HAND.

CROSSLEY'S NEW HIGH-SPEED ENGINE FOR DIRECT ELECTRIC LIGHTING.

CROSSLEY BROS., LTD., OPENSHAW, MANCHESTER.

HARRIS & PEARSON,

STOURBRIDGE, ENGLAND.

MANUFACTURERS OF

FIRE-CLAY GAS-RETORTS, FIRE-BRICKS, LUMPS, & TILES of Every Description.

GLAZED BRICKS AND PORCELAIN BATHS.

ASHMORE, BENSON, PEASE, & CO., LIMITED,

GAS-WORKS CONTRACTORS, STOCKTON-ON-TEES.

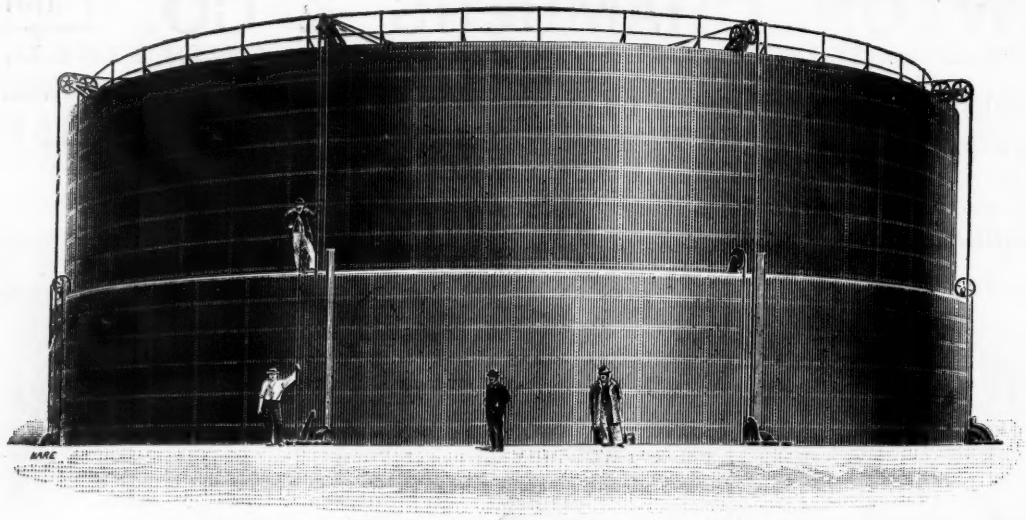


Illustration of BATHURST Holder, 82 feet diameter by 18 feet deep each Lift.

GASHOLDERS ON THE WIRE-ROPE SYSTEM

ARE WORKING AT THE FOLLOWING PLACES:—

MANCHESTER (4 Holders).
NOTTINGHAM (4 Holders).
BATHURST (AUSTRALIA).
HORSENS (DENMARK).
MILAN (ITALY).
HASLINGDEN.
DARLINGTON.
PELTON.
TYNE DOCK.
NEWBURN.
HARROGATE.
SOUTHBOROUGH.
DENTON.
ASKE.
BIRKENHEAD.
SELBY.
SLIGO.
ST. AUSTELL,
AND MANY OTHERS IN AMERICA.

LONDON OFFICE: 15, VICTORIA STREET, S.W.

SEND FOR PRICE LISTS

OF

BRAY'S

PATENT FLAT-FLAME LANTERNS,

From 30 to 1100 Candle Power.

THEY ARE SUITABLE FOR GAS OF EVERY CANDLE POWER,

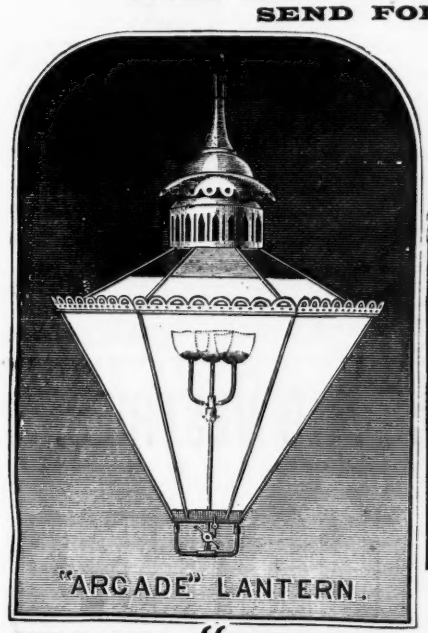
MADE ENTIRELY OF COPPER.

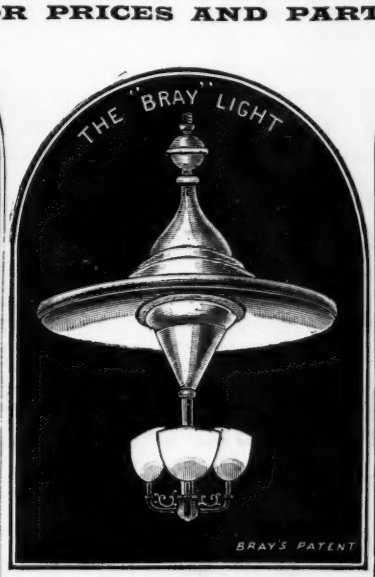
THE "BRAY" REFLECTING LIGHT

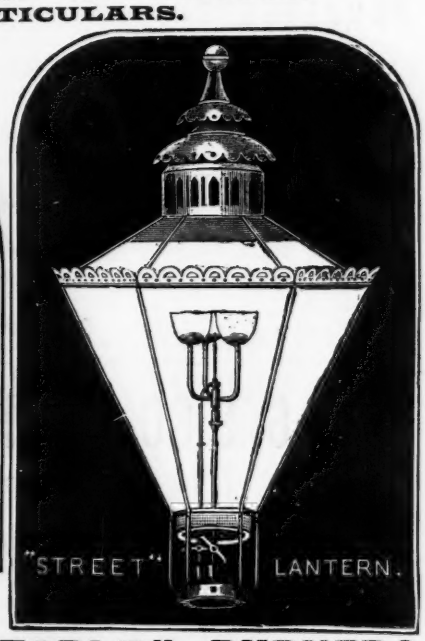
Is an unequalled combination of SIMPLICITY, CHEAPNESS, and EFFICIENCY.

GIVES REMARKABLE LIGHTING VALUE FOR GAS CONSUMED.

SEND FOR PRICES AND PARTICULARS.





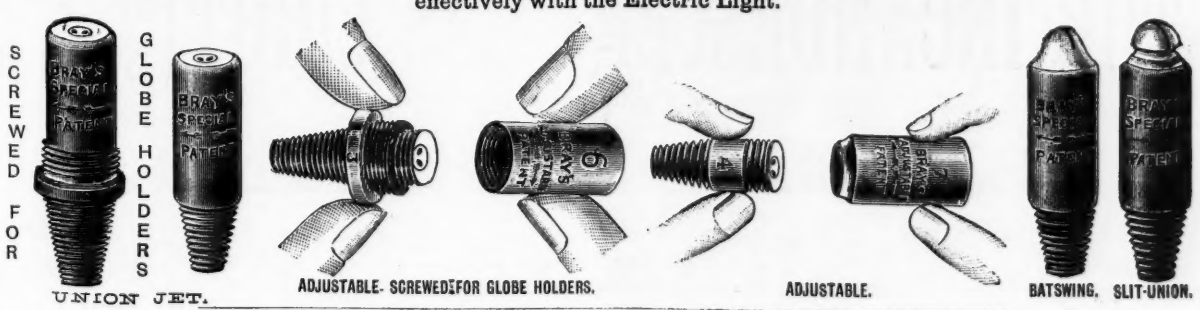


BRAY'S "SPECIAL" AND "ADJUSTABLE" BURNERS

Are the best in the Market for general use, and are very moderate in price.

It is not unusual to see the ordinary Burner yielding less than half the light that Bray's "Specials" and "Adjustables" would yield with the same consumption of Gas.

Gas Managers should try them on Consumers' Fittings; and they would see at once how to compete more effectively with the Electric Light.



SEND FOR PRICES AND PARTICULARS.

GEO. BRAY & CO., GAS LIGHTING ENGINEERS, LEEDS.

Telegraphic: "Fortress, Donnington, Salop."

C. & W. WALKER,

Telegraphic: "Fortress, London."

MIDLAND IRON-WORKS, DONNINGTON, NEAR NEWPORT, SHROPSHIRE.

London Office: 10, FINSBURY SQUARE.

PURIFIERS with Planed Joints.

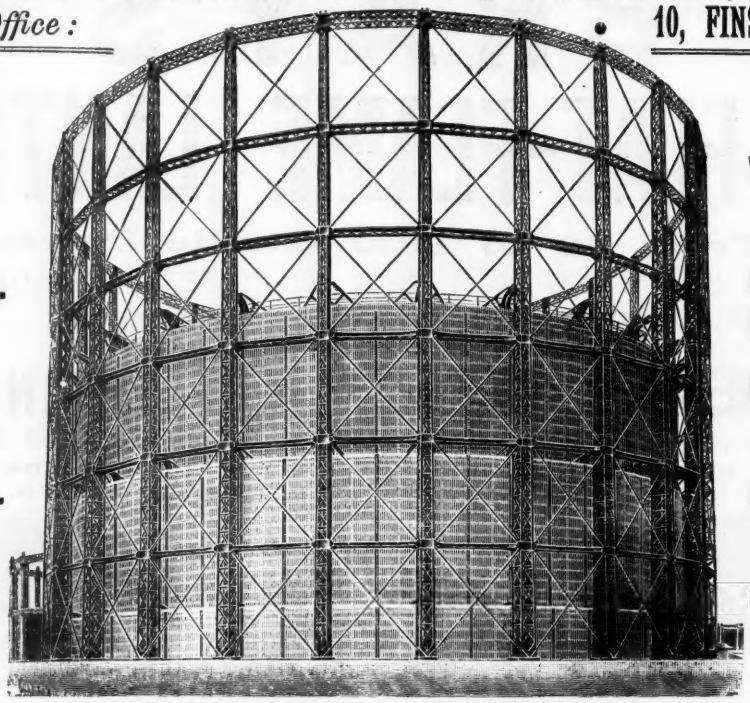
TOWER SCRUBBERS.

PURIFYING-MACHINES FOR AMMONIA.

CONDENSERS.

TAR PLANT.

SULPHATE OF AMMONIA PLANT.



GASHOLDERS.

WASHERS.

WASHER-SCRUBBERS.

CLAUS' SULPHUR-RECOVERY PLANT.

CENTRE & FOUR-WAY VALVES.

RETORT-MOUTHPIECES.

SLIDE-VALVES, TAR-BURNERS, SIEVES, &c., &c., &c.

The above is a view of the largest Gasholder (four-lift) of The Gaslight and Coke Company, Beckton, containing 8 million cubic feet, erected by us in 1892.

Sole Makers of **WECK'S** Patent CENTRE-VALVE, & **CRIPPS'** Patent HYDRAULIC MAIN VALVE.

TO GAS COMPANIES, CORPORATIONS, AND VESTRIES.

IMPROVED STREET LIGHTING,

WITHOUT ADDITIONAL COST,

With THREE to FOUR TIMES the ORDINARY LIGHT,

CAN BE OBTAINED BY

THE INCANDESCENT GAS-LIGHT (Welsbach System),

WHICH HAS NOW BEEN ADAPTED TO

STREET LIGHTING,

And is in use, with great success, in many towns on the Continent.

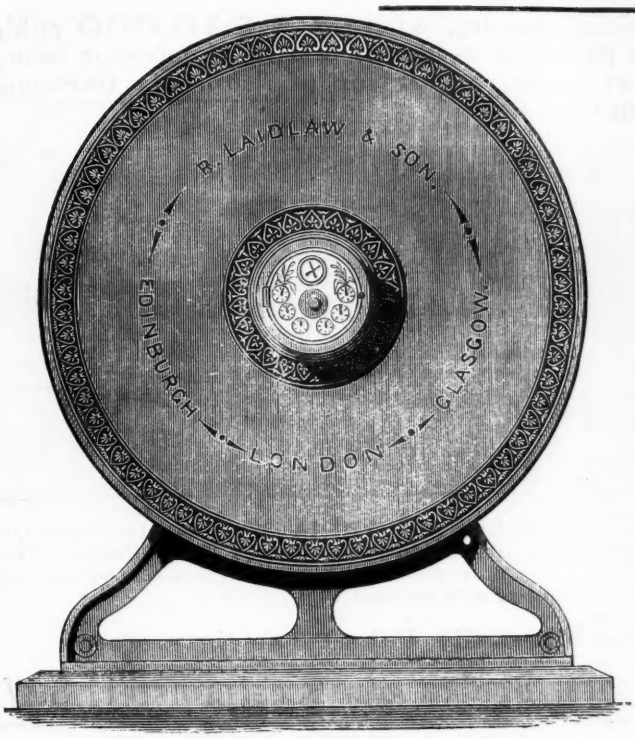
Send for "Street Lighting" Pamphlet, which gives full particulars, to

THE INCANDESCENT GAS-LIGHT COMPANY,

LIMITED,

14, PALMER STREET, WESTMINSTER, LONDON.

R. LAIDLAW & SON'S
STATION METERS
IN ROUND OR SQUARE CASES, ALL SIZES.

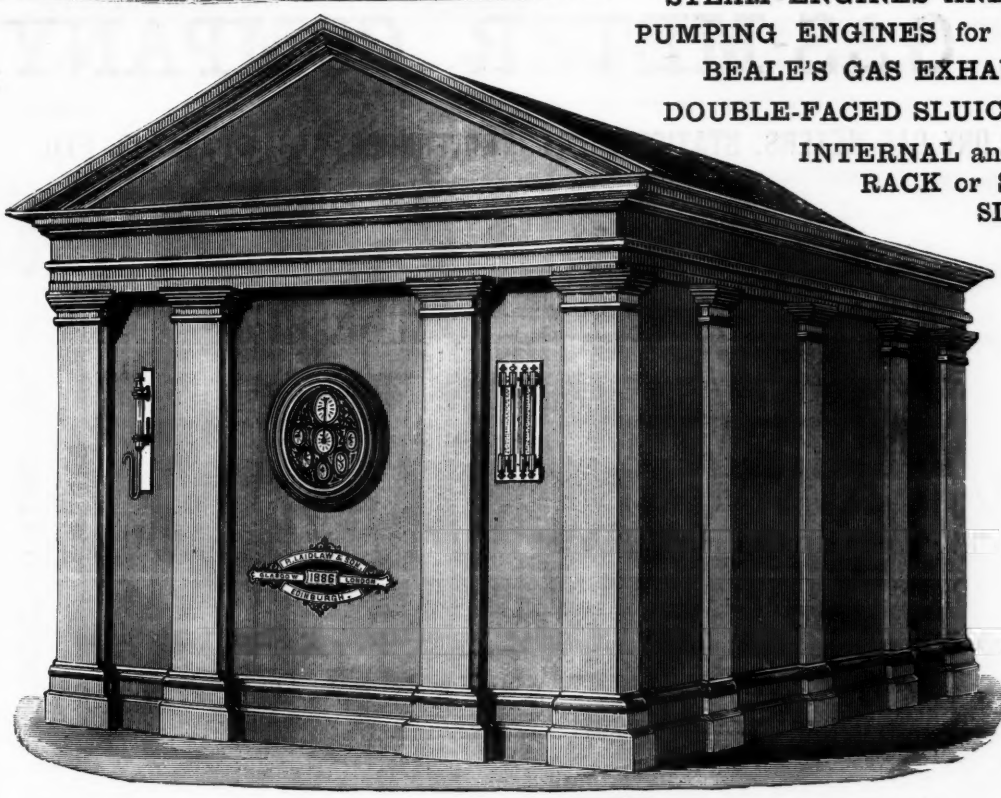


Makers in EDINBURGH of

WET AND DRY GAS-METERS,
IMPROVED STATION GOVERNORS,
PRESSURE REGISTERS,
PRESSURE GAUGES, TEST HOLDERS,
EXPERIMENTAL HOURLY-RATE METERS,
EXPERIMENTAL TEST-METERS,
CONDENSER THERMOMETERS,
SIEMENS' WATER-METERS,
STREET LANTERNS,
AND ALL KINDS OF
GAS APPARATUS AND FITTINGS, &c.

Makers in GLASGOW of

CAST-IRON PIPES (all Sizes),
LAMP PILLARS,
STEAM-ENGINES AND BOILERS,
PUMPING ENGINES for Water-Works,
BEALE'S GAS EXHAUSTERS,
DOUBLE-FACED SLUICE VALVES,
INTERNAL and **EXTERNAL RACK** or **SCREW SLIDE VALVES,**
CAST-IRON COLUMNS,
BEAMS, GIRDERS, and **WATER TANKS.**
WROUGHT-IRON TUBES, FITTINGS, &c.



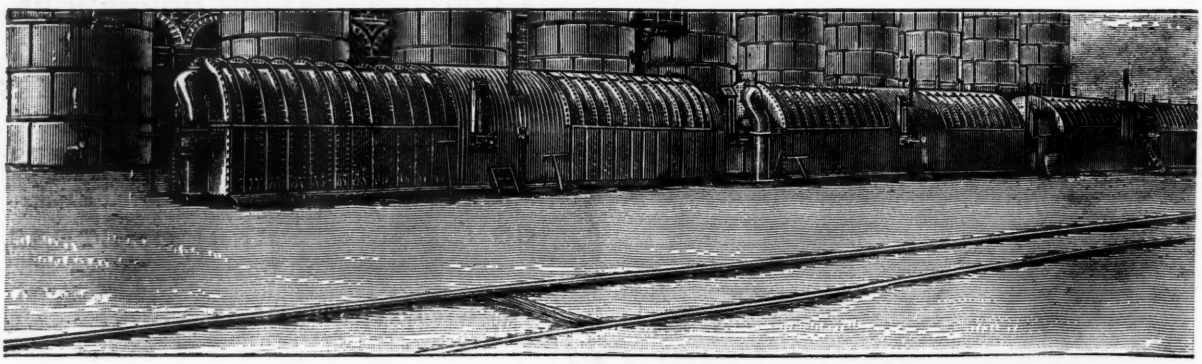
Descriptive Price Lists, Estimates, & full particulars forwarded on application.

ALLIANCE FOUNDRY, **GLASGOW.** | SIMON SQUARE WORKS, **EDINBURGH.** | 6, LITTLE BUSH LANE, **LONDON, E.C.**

KIRKHAM, HULETT, & CHANDLER, LD.

PATENT "STANDARD" WASHER-SCRUBBER.

☛ **483** of these Machines (capable of dealing with **464,340,000** cubic feet of Gas daily) in use, which fact is given as evidence of this apparatus being the Most Efficient of any in the Market for the extraction of Ammonia, Carbonic Acid, and Sulphuretted Hydrogen from Coal Gas.



View of SIX PATENT "STANDARD" WASHER-SCRUBBERS, erected at the Beckton Station of The Gaslight and Coke Company (the Engines driving same being under Galvanized Iron Covers). This Company has **30** of these Machines in use. They are also in operation at a great number of Gas and other Works in this Country and abroad.

Sole Agents in Great Britain for Marshall's Patent Tar Extractor.

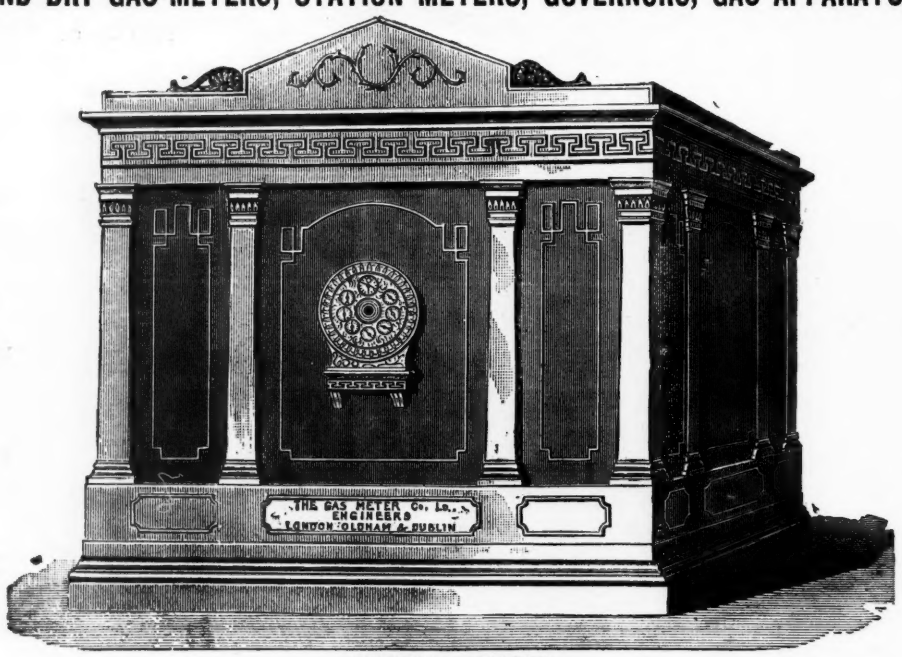
Address: 3 & 4, Palace Chambers, Bridge St., Westminster, S.W.

THE GAS-METER COMPANY,

MANUFACTURERS OF LIMITED,

WET AND DRY GAS-METERS, STATION METERS, GOVERNORS, GAS APPARATUS, ETC.

SQUARE STATION METERS WITH PLANED JOINTS.



STATION METERS IN CYLINDRICAL CASES.

DESIGN No. 2 PATTERN.

STATION METERS MADE AT THE COMPANY'S WORKS, OLDHAM, LATE WEST & GREGSON. Established 1830.

For Prices and Particulars apply to

R. L. ANDREWS, General Manager.

Works: 238, KINGSLAND ROAD, LONDON; UNION STREET, OLDHAM; HANOVER STREET, DUBLIN.

Telegraphic Address: "METER."

(See Advertisement on back of Wrapper.

JOSEPH CLIFF & SONS,

INCORPORATED IN
THE LEEDS FIRE-CLAY COMPANY, Ltd.,
WORTLEY, LEEDS.

LONDON OFFICES & DEPÔTS:
Baltic Wharf, Waterloo Bridge.
WHARVES NOS. 2 & 4, INSIDE G.N. GOODS YARD, KING'S CROSS, N.
LIVERPOOL:
16, Lightbody Street.
LEEDS:
Queen Street.

MACHINE-MADE RETORTS

Have been made in large quantities for the last twelve years; and during the whole of that time, have been in regular use at most of the largest Gas-Works in the Kingdom. They possess the excellent quality of remaining as near stationary as possible under the varying conditions of their work—a quality which will be appreciated by all Gas Engineers and Managers. The generally expressed opinion is that these Retorts are the very best that are made.

RETORTS CAREFULLY PACKED FOR EXPORT.

Fire-Bricks, Lumps, Tiles, &c., &c., of every description suitable for Gas-Works.

TELEGRAPHIC ADDRESS:
'ROBUSTNESS, LONDON."

GAS & WATER WORK

J. & H. ROBUS,

ENGINEERS & CONTRACTORS,
20, BUCKLERSBURY, LONDON, E.C.,

furnish Plans, Estimates, and Specifications for SINKING BOREHOLES *and* WELLS; *Erecting* RESERVOIRS, FILTER-BEDS, *and* GASHOLDER TANKS; *and* EVERY REQUISITE *for* GAS *and* WATER WORKS,

INCLUDING

MAIN LAYING

EXCHANGE TELEPHONE 1756.

JOHN BROWN & CO., LTD., SHEFFIELD,

Proprietors of

ALDWARKE MAIN CAR HOUSE & ROTHERHAM MAIN COLLIERIES, NEAR ROTHERHAM.

ALDWARKE MAIN GAS COAL

Analysis: 12,600 feet of 19-candle gas per ton.
Weight of illuminating power in pounds of sperm, 820·80. Very free from impurities.
Telegrams: "ATLAS SHEFFIELD."

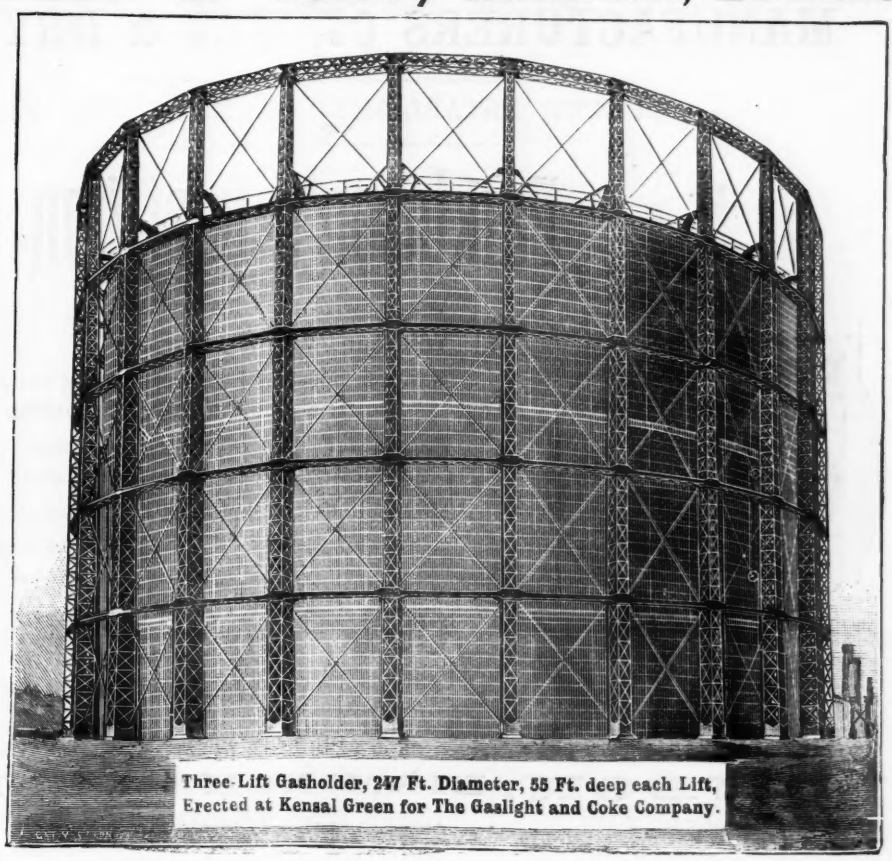
SAML. CUTLER & SONS, MILLWALL, LONDON.

NEARLY

8 MILLION

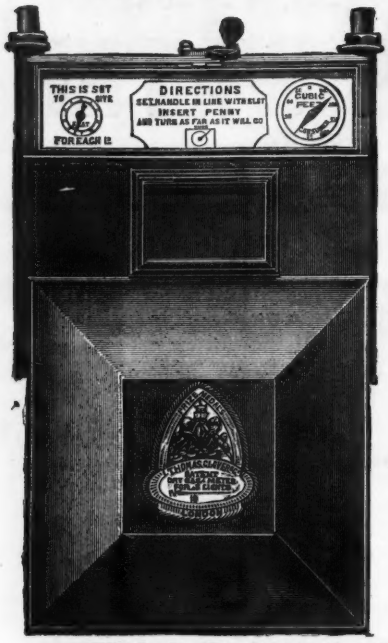
CUBIC FEET

CAPACITY.



Three-Lift Gasholder, 247 Ft. Diameter, 55 Ft. deep each Lift, Erected at Kensal Green for The Gaslight and Coke Company.

THOMAS GLOVER & CO.'S



NEW IMPROVED PREPAYMENT METER.

(PATENT APPLIED FOR.)

Simple in Mechanism.
Positive in Results.
Price Changer *in Situ.*

Guaranteed for One or Five Years at Buyer's Option.

Telegraphic Address: "GOTHIC LONDON." Telephone No. 6725.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 to 222, ST. JOHN ST., CLERKENWELL GREEN, LONDON, E.C.

BRISTOL: 62, VICTORIA STREET. *Telegraphic Address: "GOTHIC."*

BIRMINGHAM: 3, BRIDGE ROW, DERITEND. *Telegraphic Address: "GOTHIC."*

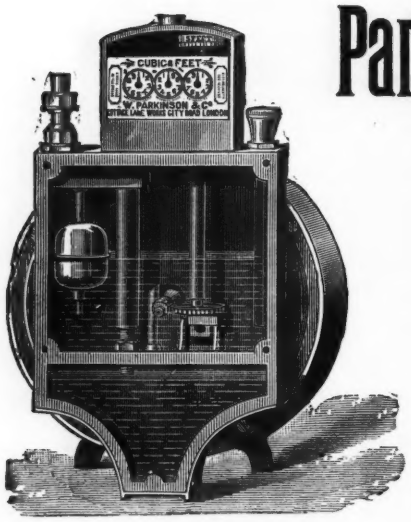
LEEDS: BOAR LANE CHAMBERS, 4, BASINGHALL STREET. *Telegraphic Address: "GOTHIC."*

MANCHESTER: 37, BLACKFRIARS STREET. *Telegraphic Address: "GOTHIC."*

W. PARKINSON & CO.,

MANUFACTURERS OF WET & DRY METERS.

OLDEST ESTABLISHED FIRM IN THE TRADE.



Parkinson's Cast-Iron Case Meter.

Works with very little friction.

Will stand very high pressures.

Cannot possibly be shut off by sudden increase of pressure; the float being affected by outlet gas only.

Allows for loss of water by evaporation without materially affecting the registration or shutting off the gas.

Unexcelled for Simplicity of Construction, Excellence of Workmanship, and Accuracy of Registration.

COMPENSATING METERS,

In Tinned or Cast-Iron Cases.

COTTAGE LANE WORKS, CITY ROAD, LONDON. Telegraphic Address: "INDEX."

BELL BARN ROAD WORKS, BIRMINGHAM. Telegraphic Address: "GAS-METERS."

10, MAWSON'S CHAMBERS, DEANSGATE, MANCHESTER. Telegraphic Address: "PRECISION."

CONTENTS.

EDITORIAL NOTES:—
GAS, LIGHTING, &c.— PAGE
Conference at Hammersmith on the Price of Gas . . . 687
The Meeting of the Commercial Gas Company . . . 687
Colonel Sadler on Gas Manufacture . . . 688
More Financial Trouble at Salford . . . 688
The Principles of Trade Unionism at Rotherham and Liverpool . . . 688
Reading Papers after Publication . . . 689
WATER AND SANITARY AFFAIRS—
The Meeting of the East London Water Company—An Explanatory Report by the Company's Engineer . . . 689
ESSAYS, COMMENTARIES, AND REVIEWS:—
Gas and Water Companies in the Stock Market . . . 690
Electric Lighting Memoranda . . . 690
Gas Acts for 1894 . . . 691
NOTES:—
Photography by Incandescent Gaslight . . . 693
Photo-Electric Phenomena . . . 693
The Action of Sunlight upon Water Microbes . . . 693
The Dazzling Effect of Flashes of Light . . . 693
TECHNICAL RECORD:—
North of England Gas Managers' Association—Half Yearly Meeting in Durham—
General Business . . . 694
Visit to the Malton Colliery—The Simon-Carvès Coke-Ovens . . . 694
Inaugural Address of Colonel Sadler, J.P. . . . 694
Gas Firing for Boilers . . . 697
REGISTER OF PATENTS:—
Utilizing the Heat Obtained by the Combustion of an Intimate Mixture of Air with Gas or Inflammable Vapour—Smethurst, W., Vickers, E. W., and Rogers, G. R. . . . 697
Atmospheric Gas-Burners for Incandescent Lights—Elster, J. . . . 697
Charging Gas and other Retorts—Arrol, Sir W., and Foulis, W. . . . 698
Gas Motor Locomotives—Holt, H. P. (Prawatke, A.) . . . 698
Patent Notices . . . 699
LEGAL INTELLIGENCE:—
Marylebone Police Court—Unlawful Consumption of Gas; A Stubborn Defendant . . . 699
MISCELLANEOUS:—
The Price of Gas in the Metropolis—Important Conference of Vestrymen . . . 700
Meeting of the Commercial Gas Company . . . 701
Salford Corporation Finances—A Serious Deficiency . . . 703
Colonial Gas Undertakings . . . 703
The Electric Lighting at Londonderry—The Repeated Bursts in the Cable; The Corporation in a Dilemma . . . 703
Meeting of the East London Water-Works Company . . . 704
The Position of the Leicester Corporation Water Supply . . . 705
Rotherham Corporation Water Affairs—Resignation of the Chairman of the Committee; Proposed Improvements in the Works . . . 705
Dublin Corporation Water Undertaking—Proposed New Reservoir; The Supply to the Out-Townships . . . 706
Notes from Scotland . . . 707
Current Sales of Gas Products . . . 708
Coal Trade Reports . . . 708
Gas and Water Companies' Stock and Share List . . . 709

PARAGRAPHS.—Mr. John Levy, 690—The Directorate of the Georgetown (British Guiana) Gas Company, Limited, 690—The Amalgamation of Competing Gas Companies in Montreal 690—Lectures on "Gas Manufacture," 690—The Salary of the Bolton Gas Manager, 690—Official Changes in the Dublin Corporation Water Department, 690—Mr. R. West, 692—Mr. Lewis T. Wright, M.Inst.C.E., 692—Electrical Measurements, 692—Issue of Debenture Stock of the Crystal Palace District Gas Company, 692—Death of Mr. W. Topley, F.R.S., 692—The Constituents of Coal, 692—The Utilization of Town Refuse, 693—Awards at the Antwerp Exhibition, 697—Testing for Ammonia with Litmus, 697—Water-Works Extensions at Brighton, 699—Boring for Coal at Balne, near Snaith, 699—Stockport Corporation and Sulphate of Ammonia Manufacture, 699—The Gas-Workers' Union and the Huddersfield Corporation Gas Committee, 699—Swansea Gas Company, 699—Electric Lighting and Gas-Meter Rent Questions at Darlington, 699—New Water-Works for Blyth, 699—Fatalities at Gas-Works, 699—The Inauguration of the Thirlmere Water-Works, 699—The Transfer of the Neath Water-Works to the Corporation, 702—Oswestry New Water-Works, 703—The Stockton Corporation Gas Coal Contracts, 703—Additional Storeage Plant for Bingham, 703—The Extension of the Water-Gas Plant at the Belfast Corporation Gas-Works, 703—The Electric Lighting Question at Folkestone, 703—West Gloucestershire Water Company, 703—New Water-Works for Lynn, 705—Spalding Water Company, 706—Sales of Shares, 706—The Management of the Halifax Corporation Gas-Works, 706—Keighley Corporation Gas Department, 707—Electric Lighting Affairs at Bristol, 707—The Belper Local Board and the Water-Works, 708—Electric Lighting at Hampstead and Ealing, 708—Complaints as to the Water Supply at Manchester 708—Tuam Gas Supply, 709—Bexhill Water and Gas Company, 709—Labour Troubles at the Rotherham Gas-Works, 709.

THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, OCTOBER 9, 1894.

Conference at Hammersmith on the Price of Gas.

As will be seen by the report which we publish elsewhere, there was a "conference" at Hammersmith last week, on the invitation of the Vestry, of delegates of Metropolitan Local Authorities, for the purpose of considering the price of gas, with a view, we suppose, to discovering how the inequality in this regard of which certain Vestries complain may be removed. This conference was stated to be the outcome of a public meeting held by the inhabitants of Hammersmith, which resulted in an appeal to the Vestry to "do something;" and it appears that the Vestry considered they could do no more than follow the lead of the Vestry of St. Luke's, Clerkenwell, who held a conference on the same subject some time ago. It seems to be admitted that the St. Luke's conference practically came to nothing; and there is pretty clear evidence that the movers in the Hammersmith affair have little hope of its being any improvement upon its precursor in point of usefulness. Still, the Chairman of the Finance Committee of the Hammersmith Vestry was willing to call together again the delegates who went to St. Luke's, in the vague hope that the matter would thereby be pushed a step forward, "as nothing "but agitation would secure what they required." The worst of it is, from these agitators' point of view, that they do not know what they want. After the St. Luke's meeting, a deputation went to the Board of Trade, where the President did not fail to point out the impossibility of the Department helping those who cannot make up their own minds as to their requirements. And as it was months ago in St. Luke's, so it was last week in Hammersmith. Every speaker held that there is something about the conditions under which London is supplied with gas which might be improved with advantage to the consumers; but no two speakers agreed respecting the nature of the trouble, or its incidence, or how it might be cured. If one delegate complained of the charge for meter-rent, another said this was naught. One speaker wanted to "down with" all gas companies; only to be implored by another not to mix up the question of municipalization of the gas supply with practical matters. Eventually the conference adopted the terms of a petition to the House of Commons—they would have nothing more to say to the Board of Trade—which we reproduce in full. It asks for an inquiry into "the present management and working "of the various Gas Companies supplying the Metropolis, "and to their existing statutory rights and the past "results—financial and general—of the statutory sliding-"scale of price and dividend" of the London Gas Companies, with a view to the introduction of a Bill "to "provide for reducing the standard price and statutory "limit of dividend now authorized to be charged "and paid by the said Companies, and for an uniform "charge throughout the Metropolis for all gas supplied, "to include the free use of meters." And the agitation is to be carried on in other ways. All this is much to be deplored, for it is not easy to see what good can come of any of it; while such legislation as the conference desires would be calamitous to the cause of cheap gas which the delegates profess to have at heart.

The Meeting of the Commercial Gas Company.

THE meeting of the Commercial Gas Company on Thursday last was of as pleasant a character as was to have been expected from the highly satisfactory nature of the business to be transacted. Mr. J. Blacket Gill, who presided, had the pleasantest of tasks to perform in telling a story of prosperity scarcely dimmed by regret for a diminished consumption; but nobody seemed to take this latter reflection seriously to heart. Gas shareholders invited to accept dividends after the rates of 13 and 10 per cent., and to allow something over and above this to be carried forward to the undivided reserve, are not disposed to be critical; and when, as in the case in point, the gas consumers have at the same time a promise of a reduction in price, there is little to be done in the shape of comment besides congratulating everybody all round. It must be a source of much gratification to the Commercial Directors that they have at last, in the prepayment meter, a means of getting at the artisan householders, whose habitations, in long, dull streets, devoid for the most part of business activity, constitute so large a proportion of their district. Mr. H. E. Jones is quite justified in taking the line he has laid down for his guidance in dealing with this class of consumption. Although it is found, as a matter of fact, that the average annual consumption through a coin-controlled meter in the East of London is about 12,000 cubic feet, the Commercial Engineer and General Manager declares that he would gladly sell a poor man as little as 1000 cubic feet of gas a year, if this is all he requires. The great point is to get the connection; for the trade is certain to pay in the long run. It also speaks well for the foresight of Mr. Robert Jones, when Engineer of the Company, that he should have so proportioned the distributing plant as to leave his successor no incidental difficulty in this respect in popularizing gas in districts where it has only been hitherto seen in the public lamps. Mr. George Livesey attended the meeting for the purpose of making sympathetic reference to the retirement of Mr. Robert Jones from his seat on the Board; and his appearance with this object was the more appropriate inasmuch as it was the co-operation of Mr. Jones in accepting in 1875 for the Commercial Company the new sliding-scale principle which the then Engineer and Secretary of the South Metropolitan Company proposed, that determined the future course of the gas

administration of London. He is a wise man who knows a good thing when he sees it; and if Mr. Jones had given no other proof of sagacity in his office than that of agreeing to take the sliding-scale for his Company when almost everybody else was afraid of it, he would have deserved excellently well of his employers, and not badly of the gas consumers of East London. No difficulty was raised at the meeting in the way of the acceptance of Mr. Walter Hunter as successor to Mr. Jones in the directorate; but there appears to be a disposition, on the part of a section of the proprietary, to force the hand of the Board in the matter of filling the vacancy left by the late Mr. Hammack. This is rather a pity; for it is a troublesome business to find two perfectly suitable new Directors for a Metropolitan Gas Company at practically the same moment; and the Commercial proprietors, in this as in other respects, should feel perfect confidence in the judgment of their Directors.

Colonel Sadler on Gas Manufacture.

THE North of England Gas Managers' Association met in Durham last Saturday, under the presidency of Colonel Sadler, J.P., of Middlesbrough, who delivered the bright and suggestive Inaugural Address which will be found in another column. This most interesting composition may be read with pleasure and profit by all gas managers, who, if not able to agree with all the writer's conclusions, can scarcely fail to learn something from his observations with regard to benzol, naphthalene, and other carburetters suitable for coal gas, which are instinct with the spirit of the manufacturing chemist who is not too busy to philosophize occasionally for pure love. After discoursing in masterly style upon tar and its products, Colonel Sadler found an encouraging word to say respecting sulphate of ammonia, which he characterized as possessing more commercial than chemical interest. This may well be the case, for while nobody knows what may yet be made from tar, the use of sulphate is simply that of manure. Yet it is satisfactory to hear upon good authority that sulphate is not likely to become a drug in the manure market. So far from this prospect being probable, Colonel Sadler roundly declares that the world is likely in the future to want all the sulphate it can get, and more; for the earth "will be richer for every added ton of sulphate placed at "the disposal of farmers." In concluding his address, the North of England President had something pertinent to say about the improved residual-recovering coke-oven as a gas-making apparatus. There is very much more than meets the eye in these observations. We, at any rate, can lay claim to the possession of an open mind with regard to carbonizing methods; for we have looked for many years for some cheap and wholesale way of making gas which shall supersede the present system of retort multiplication. Colonel Sadler calls his Simon-Carvès ovens "just a retort on a larger scale, carbonizing "5 tons of coal each charge." These ovens make better coke than the ordinary gas-retort, and they also yield tar, sulphate of ammonia, and crude benzol. But what the public want besides is gas—illuminating gas, not necessarily of high nominal lighting power, but clean, cheap, and in any required quantity. The coke-oven, as at present worked in connection with collieries like Colonel Sadler's, yields gas; but not in such proportion to the weight of coal carbonized as the gas-retort. To attempt to make it equal the small retort in this respect would be to work in the wrong direction. The shape which the improvement of gas-making methods foreshadowed by Colonel Sadler may possibly take is something totally different from anything that has hitherto been attempted, and would perhaps consist in the wholesale carbonization of coal to good coke and a comparatively low yield of rich gas; the latter to be afterwards used with the recovered benzene in carburetting, up to (say) 14-candle power, a non-luminous gas produced by the cupola treatment of a portion of the coke. The meeting was an unqualified success in every way, and abundantly justified the repetition, in Colonel Sadler's case, of the precedent of choosing an Associate for President, which worked so well in the case of Mr. Wallis, who occupied the chair of the Association three years ago. The visit of inspection to the coke-oven plant referred to in the presidential address was full of interest and instruction; and the President's hospitality generally was highly appreciated. The feeling of the Association in this regard was gracefully and wittily expressed by Mr. Charles Sellers, of York, who made the very best of an opportunity which it is not too much to say that only one other orator in the ranks of the gas industry—the genial Denny Lane—could have handled equally well.

More Financial Trouble at Salford.

THE somewhat startling announcement appeared in the newspapers on Thursday morning last that, at a meeting of the Salford Town Council on the previous day, it transpired that serious deficiencies, amounting in the aggregate to about £70,000, had arisen in connection with certain funds of the Corporation. It appears from the report which we publish elsewhere that—evidently in consequence of something that must have taken place on some previous occasion within the Corporation, for nothing seems to have been suspected outside—a Special Committee was appointed "to investigate the condition of "the finances, to ascertain how the situation has been brought "about, and who is responsible therefor, and to report what "measures are necessary to keep the expenditure of the "Corporation within legitimate bounds for the future." This Committee reported to the Council on Wednesday the fact of the deficiencies and their amount, as already stated; and without saying anything more for the time being about the other points in the reference, they recommended that the sum lost should be made up by borrowing £34,071, subject to the consent of the Local Government Board, and as to the balance by laying hands on whatever cash was to be had from such of the Corporation Committees as might happen to possess spare funds. Thus it was proposed to squeeze an extra £10,000 out of the gas profits for the current year, to appropriate £4000 from the depreciation fund account of the Water Committee, and to "convey" £12,000 received by the Technical Instruction Committee under the Local Taxation (Customs and Excise) Act, 1892. These amounts still leave £10,000 to seek. The alternative to this process of municipal brigandage was to go fairly and squarely to the ratepayers with a proposal for a supplementary rate; but it is hardly necessary to remark that this suggestion did not commend itself for a moment to the Corporation. The most ominous feature of the business so far is the complaisance of the different Committees in parting with the money of which they are the official custodians, with the object, as it appears, of hushing up a Corporation scandal. The local newspapers preserve an ominous silence respecting this affair, probably because the most delicate part of the work of the Special Committee has yet to be done; and we are not at all inclined to discuss the matter in detail until the full particulars are made public. At the same time, it is open to anybody to draw attention to the part which the Salford Corporation are making their Gas Department play in the scheme of municipal finance—a piece of evidence bearing upon the "expediency" of municipalizing gas supply which those who disbelieve in the advisability of extending this system of gas administration are not likely to overlook.

The Principles of Trade Unionism at Rotherham and Liverpool.

THERE appears to be a good deal of what is known to diplomatists as "friction" between the high contracting parties to the administration, management, and working of the Rotherham Corporation gas undertaking. The Chairman of the Gas Committee has resigned, or been driven from office; and a fierce onslaught is being made by the local "popular" press upon Mr. Newton, the Gas Engineer and Manager, mainly on the score of his alleged disinclination to abase himself sufficiently before the fetish of Trade Unionism. The trifling circumstance of there being several sets of Trade Union "leaders" disputing the *de facto* sovereignty of the Rotherham Gas-Works between them, so that, were Mr. Newton never so humble before these respective sets of High Mightinesses, he would not know which to obey, seems to go for nothing in mitigation of his imputed offence of high treason. One local organ of public opinion asserts that the workmen employed at the Rotherham Gas-Works have been "subjected to "treatment which no self-respecting man who is imbued "with the principles of Trade Unionism would abide." This is a dreadful charge; and it loses nothing of its impressiveness by being left in the vague. One may be excused for not knowing precisely what is the Rotherham

standard of proper treatment of gentlemen duly saturated with Trade Union principles; but, from something that happened last week in Liverpool, it may be gathered that some Trade Unionists at any rate are still of a peculiarly touchy disposition, notwithstanding the healthy discipline administered to sufferers from the same complaint at Hull and elsewhere. It appears that a certain stevedore doing business at the Liverpool Docks employed members of the Dock Labourers' Union to load a couple of steamers; and he kept one gang working until four minutes to twelve, while, under the Union rules, the half day finished at ten minutes to twelve. Hereupon the Union Secretary claimed that the men upon whom this outrage had been perpetrated should be paid 2s. 6d. for the six minutes' work, or be kept on for the second half day. The stevedore failed to see the equity of this demand; and, in order to bring him to his senses, the Union official proceeded to the gang employed upon the other vessel, and called them out in the orthodox Havelock-Curran-Mann-Burns style of a year or so ago. Some of the men obeyed the summons; but others thought better of it, and went on working. Then the Union held a meeting, and imposed a fine of £5 each on the rebels, besides decreeing their dismissal from the ship, and the substitution of other Union men. Again the stubborn stevedore declined the terms offered to him; and the delegates tried to take away his men. Failing in respect of four of their own members, the delegates proceeded to interview the owners of the steamer; but they were told that, unless the men were sent back to work, no Union members need apply for employment for the future. Meanwhile, the loading of the ship went on, and she sailed in due course. It is the old story. Like the Bourbons, Trade Union leaders can learn nothing; nor can they forget anything of their old trickery, whenever there appears to be the barest chance of putting it in operation. It must be admitted that people of this character are difficult to get on with.

Reading Papers after Publication.

It is interesting to mark how the younger and livelier learned and scientific societies are breaking down the barriers that old-fashioned organizations are still disposed to keep up between their Transactions and other means of gaining publicity open to contributors of papers. It is not long since the suggestion of having printed slips of papers ready in advance to be distributed among the audience at society meetings was accepted, not without misgivings, by some greatly daring councils; and now the advantage of this procedure has been very generally recognized, especially by members of technical societies who are liable to be treated by writers of papers with large doses of figures. It has lately been announced by the Council of the Physical Society that they have decided to make a new departure of a distinctly novel kind in their treatment of contributors of papers. It has been the practice of the Society for some time past to circulate printed copies of the more important communications among members who were thought likely to take part in the discussion upon them; and it has thus been proved that previous knowledge of the contents of a paper promotes, instead of detracting from, the interest with which the author's account of his work is heard and commented upon by the Society at its meetings. The Council of the Society now feel that cases may from time to time arise in which the author may wish that his paper should be published as soon as possible. They have therefore come to a decision that if an author so desires, and if such a course appears desirable, they will take steps to ensure that the publication of a paper is not in any way delayed in order that it may be read before publication, and that they will even, if necessary, postpone the reading and discussion of a paper until after it has been published. In making this announcement, the Council believe that the ordinary procedure of the Society with regard to reading and publication will be much the same as heretofore; but they wish it to be understood that they are willing to meet contributors, and to deal with special cases in an exceptional way. This is a sign of the times that other societies would do well to heed; for it is certain that those technical and scientific organizations will do best which suit themselves to their public, instead of expecting everything and everybody to give way to, and bow down before them.

WATER AND SANITARY AFFAIRS.

The address of the Chairman, Mr. George Banbury, at the half-yearly meeting of the East London Water Company last week, dealt with various questions of more than ordinary importance relative to the Metropolitan Water Supply. The works the Company already have in hand, independently of those which will be carried out under their new Act, naturally came under review. The present operations include additional pumping plant, a new high-level reservoir, and a powerful engine about to be set at work at Walthamstow, together with new filter-beds for the extensive district served by the Company in Essex. The capital just authorized by Parliament will provide for additions to the Walthamstow storeage, as recommended by General Scott, and approved by the Royal Commission. The ground requisite for this purpose was obtained some years ago; the Company never supposing that Parliament would oppose an extension so obviously necessary in order that a large and increasing population might have a due supply of water. But the opposition to the Company has taken no account of public wants; and the qnarter whence this opposition arose now finds it politic to censure the Company for not having provided additional reservoirs "years ago." As Mr. Banbury very properly remarked in his address, when the Company for the second time brought forward their Bill to enable them to execute such works, the project was opposed by the London County Council "and others" (he might have said "the Govern-"ment"), mainly upon the ground that "a further supply "was not needed, that there was no hurry about the "matter, that the County Council should have still "further time to consider the report of the Royal Com-"mission, and that the Bill would add to the purchase "price of the Company." To meet these objections there was the strongest possible array of facts; and it only needed that the Bill should go before an impartial tribunal, in order for the scheme which it embodied to be finally accepted. By the bare majority of one, this result was achieved; and it is painful to think by what a mere hair's breadth the deliverance of London from a collapse in the water supply was effected. As we observed at the time, the fate of the Southwark and Vauxhall Bill was bound up with that of the East London. It will now be seen how thoroughly the Metropolitan Water Companies recognize their responsibilities, and how ready they are to fulfil their obligations, although in doing so they have to encounter the trouble and expense of a contest in Parliament. Even as it is, the conditions under which the new capital is to be raised are onerous in a peculiar degree. Neither is the main question absolutely settled. The County Council have nine Water Bills in hand for the coming session—eight for purchase, and one for a separate supply. For the precise terms on which purchase is to be proposed, we must wait, as Mr. Banbury intimated, until the time when the Private Bills for the coming session have to disclose their details.

A very instructive report from Mr. Bryan, the Engineer to the East London Company, was laid before the meeting of shareholders by the Chairman. A more complete answer to the complaints as to a partial and temporary restriction of the constant supply can scarcely be conceived. The supply to 54,000 houses is still continuous; and the mains have been always charged throughout the entire district, so as to meet the contingency of fire—the service-pipes alone being shut off. During the intermittent supply in parts of the district, concerning which such loud complaints have been made, the average volume distributed for domestic purposes per head of the population, throughout the Company's area, has been about double the domestic supply given by the Manchester, Nottingham, and other corporation water-works. In fact, despite the restriction, the supply in East London has been ample, supposing it to be properly used. Had there been cisterns in the houses, no inconvenience would have been felt. An average of 249 gallons per tenement daily is inconsistent with the idea of actual scarcity; and is really equal to the average over all the rest of London. The case is strikingly put when Mr. Bryan says: "If the "tenants of property would merely turn off their taps "when they had drawn off what they require, the full and "constant service could be immediately reverted to." These are the statements to which the County Council critics will take no heed, though they lie at the root of

the question. As for the meteorological conditions, these date back to last year, when the great drought reduced the amplitude of the springs. The very deficient rainfall of the following winter made matters worse; and the recent heavy rainfall has been dissipated by evaporation coupled with the action of the long grass, so that none of the rainfall in July and August reached the Lea, although such a rainfall in the winter months would have caused a flood. We are glad to find, from Mr. Banbury's remarks, that the Company have succeeded in conferriug with some of the local Sanitary Authorities, so as to explain the circumstances of the present case, at the same time asking the help of these bodies to check the excessive waste of water on the part of the inhabitants. It appears, from Mr. Bryan's statement, that the partial shutting off in the supply has only been adopted in those localities where there has been great waste. A fact of yet greater moment which we gather from Mr. Bryan's account of the matter is that, if the new reservoirs just sanctioned by Parliament had been in existence a year ago, the deficient rainfall would yet have sufficed for these receptacles to have been filled "many times over." Perhaps there is no question affecting the Metropolis which is more thoroughly misunderstood, or on which the public judgment is more completely led astray, than that which relates to the supply of water. Not even the report of a Royal Commission is sufficient to remove very much of the prevalent misconception, as witness the recent letter in *The Times* by Sir John Evans, noticed last week.

Mr. John Levy, one of the Directors of the Rochester, Chatham, and Strood Gas Company, died, at his residence at Lee, last Thursday.

The Directorate of the Georgetown (British Guiana) Gas Company, Limited.—The recent death of Mr. Alfred Williams has caused some changes in the directorate of the above-named Company. Mr. Charles Gandon succeeds Mr. Williams in the chairmanship; and Mr. Alfred Lass, F.C.A., fills the position of Deputy-Chairman, formerly occupied by Mr. Gandon.

The Amalgamation of the Competing Gas Companies in Montreal.—In the JOURNAL last week, reference was made to the fusion of the new and old gas undertakings in Montreal. According to a paragraph in the *Montreal Gazette* of the 25th ult., the arrangements were completed on the previous day; the contract of amalgamation being signed by Mr. H. S. Holt and Mr. John Coates, the Presidents of the two Companies. The price paid for the new undertaking is $387,000.

Lectures on "Gas Manufacture."—We are asked to mention that a course of lectures on "Gas Manufacture," intended for those who are desirous of preparing for the City and Guilds of London examination, is in course of delivery by Mr. W. Grafton at the Polytechnic, Regent Street. Mr. Grafton had a similar course of lectures last year, with most successful results. Eight students went up for examination in the Ordinary Grade, and seven of them obtained first-class certificates—one winning the second prize, and two of the others, of equal merit, gaining third prizes. This is a gratifying record.

The Salary of the Bolton Gas Manager.—Some discussion took place, at the meeting of the Bolton Town Council on Wednesday, on the recommnedation of the Gas Committee, referred to last week, to increase the salary of the Gas Manager (Mr. W. Smith) by £50 per annum. Objections were raised that Mr. Smith had not very long since had an advance of £100 per annum; and the proposed further addition was regarded as premature. The Chairman of the Committee pointed out that it was more than four years ago that the advance was made; and that since Mr. Smith's appointment in 1886 the sale of gas had augmented to the extent of 34¾ per cent., while the capital employed per ton of coal carbonized had been reduced from £9 18s. to £6 16s. Moreover, both the manufacturing and distributing plant had been thoroughly overhauled under his supervision. On a division, the recommendation was adopted by a very large majority.

Official Changes in the Dublin Corporation Water Department.—In consequence of the death of Mr. James Andrews, the Water Committee of the Dublin Corporation recently requested the Borough Surveyor (Mr. Spencer Harty) to furnish them with some suggestions as to the re-arrangement of the duties of his department, more especially with reference to the water-works. This he has done, with the result that Mr. Henry Allen has been promoted to the position of Assistant-Engineer, at the initial salary of £250, advancing, by annual increments of £20, to £350. Mr. Allen has been sixteen years in the service of the Corporation, and has been largely employed on water-works engineering and general office work connected with the department. The post of assistant engineer in charge of the main line works is to be advertised; and Mr. M'Cabe is to continue to have the supervision of the waste-water department—excellent results having accrued from his labours.

ESSAYS, COMMENTARIES, AND REVIEWS.

GAS AND WATER COMPANIES IN THE STOCK MARKET.

(For Stock and Share List, see p. 709.)

THE week just closed has furnished a sensation. It began in a very sleepy mood; and Monday and Tuesday were quietly dozed through—the Jews being away holiday-making. On Wednesday, without a moment's warning, the now memorable war scare fell upon the sleepers, and electrified them into action It was an unreasonable thing, and ought not to have been possible; but then the public are unreasoning, and almost anything is possible with them. When once started, astute people worked it hard, and made the most of it to their own considerable advantage. It was soon over, and a rapid recovery set in which was only checked by apprehensions (which, unhappily, appear to be well founded) concerning the Tsar. Meanwhile, the Gas Market, not susceptible of such sinister and adroit manipulation, pushed steadily on; and business in the earlier portion of the week was especially active. The larger issues were considerably dealt in; and a feature of the week was the demand for choice guaranteed securities. Gaslight "A" started off at a great rate, and on Wednesday ran up as high as 250½. But the pace was too good to last; and, after some amount of steadying, the closing mark was 248¾, with a net gain of one point on the quotation. The debenture and preference stocks were very brisk; and the 6 per cent. issue of the former gained two points. South Metropolitans were very strong, but could not make any further improvement upon their recent liberal advance. Nothing was done in Commercials, except a small special bargain in the new stock—sellers being scarce. The Suburban and Provincial undertakings were very quiet; and the only move was an advance in Alliance and Dublin. The Continentals were fairly active, and very firm—in fact, the steady prices commanded would have warranted better quotations. Among the rest, the little dealt-in Chicago bonds made a move up at last; and Melbourne bonds are fractionally better *ex int.* The Water Companies were almost stagnant, except on Friday, when a small amount of business was done. Two or three have advanced their quotations; all the rest are very firm.

The daily operations were: The Gas Market opened quiet, and hardly anything was touched but Gaslight "A," which hardened as the day went on; but quotations did not move. On Tuesday, there was considerable increase of activity. Gaslight "A" rose 2; and everything else that was dealt in realized good prices. The general situation remained almost identical on Wednesday; and further advances were made. Alliance and Dublin rose ½; Chicago, 1st bonds, 1½; and ditto, 2nd bonds, 3. Business slackened off a little on Thursday; and the selling figure of Gaslight "A" was put back. In Water, East London and Lambeth 10 per cent. gained 2 each; and ditto 7½ per cent., 1. Friday's transactions were largely in Gaslight secured issues, all of which were strong; while the 6 per cent. debenture rose 2. Saturday was quiet and featureless; and quotations remained unchanged.

ELECTRIC LIGHTING MEMORANDA.

The Affairs of the Brush Company—A Dramatic Episode in the Electric Lighting of Bristol—The Electric Light Troubles in Londonderry.

THE Brush Electrical Engineering Company have held their fifth annual general meeting, under the presidency of Mr. J. B. Braithwaite, jun. (the Chairman of the Company), when the Directors' report and the statement of accounts were received and adopted. The latter show a gross profit of £57,157, reduced to £27,280 by deductions for general charges and interest on debenture stock. After providing the full dividend on the preference shares, and an interim dividend at the rate of 5 per cent. per annum on the ordinary shares, for the half year ended Dec. 31 last, enough money remained to pay a further dividend at the same rate on the ordinary shares for the six months to June 30; leaving £3788 to be carried forward. In his speech at the meeting, the Chairman stated that the past year was one of continuous employment in the Company's factory, and also of great commercial prosperity for the concern generally, considering the very keen competition that now prevails in the electrical engineering trade. The Directors have had to recognize that the factory is the only support the Company can now look to; and they have accordingly shut up and written off their Cardiff and Manchester stations. It is also perceived that the future prosperity of the factory is dependent upon the continuance of the receipt of orders for plant; and as with the completion of the City of London Electric Lighting Company's contracts, and other big jobs in hand, business may not be so brisk or so profitable, the Directors prudently carry forward a substantial undivided balance. They do this, as the Chairman confessed, because the balance-sheets published by two of the Brush Company's competitors—the Electric Construction Company and Messrs. Crompton and Co.—"are of such a character that neither of them have earned their preference dividend out of trading profits;" and it therefore occurred to the Brush Company's Directors that "now was the psychological moment to increase our carry-forward." This

is an unkind reflection upon the victims of the comparison. But, of course, *à la guerre comme à la guerre;* and there is no obligation upon rivals in trade to spare one another's vulnerable points. We doubt not that Mr. Crompton and others in the same line could say some unpleasant things about the Brush Company's outlook, if they thought it worth while. It may be remarked that the Brush Company have in operation an employees' bonus scheme, which was started in 1887, and has been developed until last year the sum distributed among 163 participants was £2488. For the present, the hopes of the Company in the matter of future orders appear to be centred in the City of London Electric Lighting Company and another undertaking of which Mr. Braithwaite expects great things—the County of London Electric Lighting Company, the name of which does not prevent it from doing lighting business at Bournemouth, Dover, and in the Windermere district. The Chairman is particularly anxious for the actual Brush Company to live down the evil reputation acquired by the old "Grandfather Brush," whose malpractices it has taken nearly ten years to undo.

It has frequently been our duty—with which a certain amount of pleasure has very naturally been blended—to record in this column the malignancy of Fate in regard to electric lighting breakdowns. The observation of the cynical Frenchman, that men experience a certain amount of a feeling which is not dissatisfaction at the sight of the misfortunes of their best friends, abundantly justifies this admission on our part. Besides, if the electricians are, in point of fact, good friends of the gas industry, which might very well be argued, it is certain that many of them "dissemble their love" so perfectly when engaged in the, to them, congenial task of expatiating upon the shortcomings of gas lighting, that they cannot fairly complain of our making use of opportunities for reprisal with which circumstances occasionally provide us. There is scattered up and down through the pages of the JOURNAL for the past ten years and more a considerable number of stories illustrating how unkind Fate can be to too-confident electricians; but one of the best and most dramatic of these mishaps occurred last Sunday week in the Church of St. Nicholas, Bristol. "The preacher"—we quote from a local newspaper—"selecting a text for the times, dwelt upon the present phase of unbelief, and spoke of one of those phases having developed a disinclination to believe anything which could not actually be seen. 'Picture,' said the speaker, 'the blind telling us that the things around us with which we are familiar were not in existence, because the blind themselves could not see them.' The preacher had uttered the words 'there are things around us which we cannot see'—when out went the electric light; leaving the place in utter darkness, as there came from Minor Canon Metford's lips the context—'although we are sure they are there.'" The service had to be finished somehow in the dark; and while it is satisfactory to learn that "thanks to the Vicar's tact, there was not the slightest confusion or disorder," it can easily be believed that "the scene was so strange that it will not be readily forgotten by the congregation of St. Nicholas."

A peculiar state of affairs appears to have arisen in connection with the electric lighting undertaking of the Londonderry Corporation. As we have had recent occasion to report, there has been a troublesome and disquieting series of faults in the distributing cables; but who is responsible for these breakdowns is not at present quite clear. In addition to this, there is tension approaching the breaking-point in the relations between the Corporation Lighting Committee and their Electrical Engineer; the workmen employed at the generating station want higher wages; and there are ugly imputations in the air upon the behaviour of certain prominent members of the Corporation, well known as electrical enthusiasts, who are accused of keeping away from the Committee meetings now that it is a question of facing the responsibility for what threatens to be a disaster. One city councillor talks of shutting down the station; an alderman thinks the question should be put as to where all the "insane expenditure" is to end; and another councillor thinks the condition of affairs serious enough "to make the citizens of Derry come up and compel the whole of the Corporation to dissolve." A special meeting of the Lighting Committee has been called for the purpose of inquiring into the whole matter. Meanwhile, the ratepayers are much moved with regard to the way in which the business of the town is done; and the local newspapers are unable to offer an opinion as to whether things are all right or all wrong with the electric lighting undertaking. It is very early days for the townspeople to tire of their new toy; and, of course, the Corporation have far too heavy a stake in this new department of the public service to confess a failure without putting forward every effort to avert such a catastrophe. As matters are going now, however, it looks as if the first thing to be done by the Corporation, after holding their own inquiry and getting such satisfaction as can be derived from an examination of their own officers respecting the points at issue, should be to procure the attendaunce of their Consulting Electrical Engineer, for the purpose of reporting upon the fashion in which the scheme as passed by him has been carried out. Until this has been done, it will be impossible for anybody to ascertain how far the present outburst of municipal and public feeling is justified by the facts, and how much of it is referable to causes that divide members of local authorities in all parts of the world.

GAS ACTS FOR 1894.

ACCORDING to annual custom, we give hereunder an abstract of the Acts passed during the last session of Parliament relating to gas undertakings.

The Croydon Gas Act provides mainly for the amalgamation of the Carshalton Gas Company with the Croydon Commercial Gas and Coke Company. The first-named Company were incorporated under an Act of 1877 for the supply of a district comprising parts of the parishes of Carshalton and Beddington and the hamlet of Wallington and the parish of Woodmansterne, in Surrey. The Croydon Company were incorporated under several Acts—the last being dated 1887—pursuant to which they supply gas in the town and parish of Croydon and the parishes of Addington, Beddington, Coulsdon, and Sanderstead, in Surrey. The amalgamation was by agreement between the two Companies. The districts are united by the Act; and the provisions of the Croydon Acts with regard to illuminating power, purity, and pressure are applied to the united district. The Amalgamated Company succeeds to certain powers as to lands, &c., originally vested in the Carshalton Company. The capital of the entire undertaking is the aggregate authorized capitals of the two Companies, subject to the provisions that old Carshalton 10 per cent. capital becomes 7 per cent. "Carshalton capital" in the Amalgamated Company; the old Carshalton 7 per cent. capital becomes capital of the same denomination; while the Croydon Company's capital remains unchanged. The different classes of capital may be converted into stock, to be issued, if it is thought fit, in £5 lots. The standard price of gas in the Carshalton district is fixed at 4s. 7d. per 1000 cubic feet, subject to the provision that the price actually charged in the Carshalton district shall never be more than 1s., nor, for a period of ten years from the time of amalgamation, less than 6d. in excess of the price for the time being actually charged in the Croydon district. The compensation payable to the retired Carshalton Directors is fixed at seven years' purchase of their fees for the year previous to the amalgamation. The rotation of the Directors is detailed; and the retiring allowances of the Carshalton officers are defined.

The Harrow and Stanmore Gas Act confirms an agreement for the acquisition by the Harrow District Gas Company of the undertaking of the Great Stanmore Gas Company, Limited. The Harrow Company were incorporated by an Act of 1873, upon the dissolution of the Harrow Gaslight and Coke Company, Limited, with a capital of £45,000. The Great Stanmore Company date from 1858; and they had a fully paid-up capital of £10,000, with no mortgage debt. This Company's works were leased to Mr. J. L. Chapman for a term expiring on March 25, 1895. The present Act extends the limits of supply of the Harrow Company to include the district of the Great Stanmore Company, subject to the provision that, without the consent of the lessee, the Company shall not supply gas in any place for the time being supplied by him with gas under the terms of his lease. The existing capital is defined; and it is enacted that upon the date of transfer there is to be created additional share capital of the Company of the nominal amount of £10,000, to be called guaranteed shares, and to bear a fixed perpetual cumulative guaranteed dividend at the rate of 6 per cent. per annum. These shares are vested in the proprietors of Great Stanmore capital, in substitution for their original holding. Power is given to the Company to raise £40,000 in the form of additional "C" capital, bearing a 7 per cent. dividend. An insurance fund may be formed out of profits, by appropriating 1 per cent. upon the paid-up capital for this purpose, after which all excess of profits are to be carried to the credit of the divisible profits of the undertaking for the next following year. A reserve fund may be created out of surplus divisible profits, if the price of gas has been so reduced as to bring the sliding-scale into operation. The profits of the Company available for dividend are to be applied as follows: First of all, in payment of the 6 per cent. perpetual cumulative guaranteed dividend on the guaranteed shares; and the balance is to be employed in the payment of the respective dividends to which the "A," "B," "C," and new "C" capitals are for the time being entitled. When and so long as the "C" capitals are entitled to more than 6 per cent., the guaranteed shares are also to have a contingent increase of dividend up to 1 per cent. In addition to the sum of £11,250 which the Company are already entitled to borrow, they may raise one-fourth of the amount of the new capital paid up. With regard to the selling price of gas, the following provisions apply: From the quarter-day next after the passing of the Act, the standard price is fixed at 4s. per 1000 cubic feet for gas supplied within a radius of one mile from the King's Head Hotel in Harrow. For every penny upon this price, up or down, the original capital is to have 5s. per cent. allowance; and the 7 per cent. capital 3s. 6d. per cent. It is provided that, as from the same period, the price to be charged by the Company within this radius shall not exceed 4s. 3d. per 1000 cubic feet until the Company shall have for the first time paid a dividend on their "A" capital of 9¼ per cent., and on the "C" capitals, old and new, of £5 9s. 6d. per cent. per annum, "unless the cost to the Company per ton of coals delivered at their works shall, in the opinion of a competent and impartial Referee, having a practical knowledge and experience in the manufacture and supply of gas (who shall be

appointed by the Board of Trade upon application by the Company or by the Harrow Local Board) justify an advance beyond the said price of 4s. 3d. per 1000 cubic feet; and such advance of price, and the date of its commencement and the period of its duration, shall be determined by the said Referee." Beyond the radius, an additional 3d. per 1000 cubic feet may be charged. Gas of 15-candle power is to be supplied within the existing limits, and also in the extended limits after March 25 next. When and as soon as there shall have been paid by the Company a dividend of 9 per cent. on the "A" capital, the following provisions with respect to the purity of the gas are to take effect: The gas shall not contain more than 20 grains of sulphur in any form in 100 cubic feet, subject to a penalty of £5 for default; but the Company are not to be liable to any penalty if the defective purity arises from accident or unavoidable cause, nor unless the excess of sulphur amounts to 2 grains upon the average of six consecutive week days, or to 10 grains upon any one day. Complaints are to be made within six weeks. A map of the gas-mains is to be made within a year, to a scale of not less than 25 inches to the mile, and to be open to the inspection of the officers of the Local Board on payment of a fee of 1s. The remuneration of the Directors and Auditors is not to exceed £500 per annum until the make of gas amounts to 100 million cubic feet per annum. On and from the date of transfer, the name of the Company is changed to that of the Harrow and Stanmore Gas Company. The Company may contract for the sale of gas in bulk, but not for terms exceeding three years. Gas consumers are to give 24 hours' notice of removal; and, in default, they are liable to pay up to the next usual period for ascertaining the register of the meter. Notice of this provision is to be endorsed on every demand-note for gas. The agreement for transfer forms a schedule to the Act.

The Hebden Bridge Gas Act empowers the Company to raise £25,000 of new 7 per cent. capital, and to borrow up to one-fourth of this amount. The Company cannot, except with the consent of the Hebden Bridge District Local Board and the Mytholmroyd District Local Board, raise any capital under the provisions of this Act (except so far as may be necessary for defraying expenditure on capital account made in the ordinary course of the proper conduct of the affairs of the Company, and with the intention of benefiting the undertaking) until Dec. 21 next; and if the Local Boards, or either of them, shall introduce a Bill into Parliament, and *bonâ fide* promote it in the next available session of Parliament, to empower them to purchase the Company's undertaking, the Company are not to raise any of the capital except with the consent and for the purposes already named, during the promotion of such Bill. Additional gas lands are to be taken. The standard price for the 15-candle gas to be supplied by the Company under the Act is fixed at 3s. 6d. per 1000 cubic feet. The Torquay Gas Act empowers the Company to take additional gas lands and to raise £50,000 of new 7 per cent. capital, with the usual borrowing limits. The maximum price of 4s. 3d. per 1000 cubic feet is fixed, and the regulations for testing are revised. Discounts not exceeding 10 per cent. may be allowed to gas consumers, in consideration of prompt payment or of large consumption. The Paington Gas Act dissolves and reincorporates a Limited Company formed in 1859, and having at the passing of the Act a share capital of £13,800 in fully-paid shares, with a loan of £1750. The capital of the Company is stated to be £35,000, whereof £21,200 is additional 7 per cent. capital, with the usual borrowing powers. Directors are not to be disqualified by holding office under the Company, or being interested in any contracts with the Company; but they are not to vote upon such questions if they are interested in them otherwise than as Directors. The Company are to pay 4 per cent. interest upon consumers' deposits, and are empowered to demand payment in advance in certain cases. The standard price of 3s. 10d. per 1000 cubic feet is fixed for 15-candle gas. The period of error in defective meters is limited to the current quarter. Contracts for the supply of gas in bulk are not to be made for more than seven years.

The Plymouth and Stonehouse Gas Act converts the Company's old 10 per cent. shares into ordinary 5 per cent. stock. The borrowing powers in respect of the existing capital are fixed at £50,000. Additional 5 per cent. stock to the amount of £80,000 is authorized, carrying the usual borrowing powers. The standard price of gas is continued at 2s. 6d. per 1000 cubic feet; but the rise and fall of dividend under the sliding-scale is altered to 2s. 6d. per cent. for a penny. The provisions of the Company's Act relating to the dividend payable on the 7½ and 7 per cent. shares in force immediately before the passing of the Act are continued in force unaffected by anything contained in it. Stock that has been offered for sale by auction or tender, and not sold, may be offered at the reserve price to consumers or employees. Gas of 15-candle power is to be supplied. It will be noticed that, after all the discussion that has taken place upon the subject of the equitable conversion of the Company's 7½ and 7 per cent. shares, the attempt has been relinquished. The Preston Gas Act extends the Company's limits of supply; the price of gas in the added area being restricted to a maximum of 5s. per 1000 cubic feet. Additional lands are to be taken for the purposes of gas manufacture, and a new road constructed, of which the Corporation are to have a user; paying their proportionate cost of repairs. Additional capital to the amount of £120,000 may be raised, to bear a 5 per cent. dividend. If the clear profits of the Company in any year amount to a larger sum than is required for the authorized dividends, the Company must, out of the excess, or such portion of it as is not carried to the insurance fund, in the first place pay the holders of the 10 per cent. ordinary stock the difference between the dividend actually received by them for the year 1893 and a full 10 per cent. dividend; carrying the residue to the credit of divisible profits for the next ensuing year. A clause of the Act deals with the laying of gas-mains in undedicated roads. Notices of discontinuance must be in writing; and the consumer is liable to pay for all gas registered by his meter up to and until the expiration of 48 hours from the giving of such notice. Prepayment for gas may be required in certain cases. The period of error in defective meters is limited to the current quarter. Consumers of not exceeding 2 million cubic feet of gas per annum are entitled to 15 per cent., and of more than this quantity to a discount of 20 per cent., if the account is paid within 21 days. The higher standard price for gas supplied in Preston is fixed at 3s. 10½d. per 1000 cubic feet. The sliding-scale is modified to secure equal treatment to the holders of the 10, 7, and 5 per cent. classes of capital. There is a "neutral zone" of price extending between the higher standard already given and a lower standard of 3s. 5½d. per 1000 cubic feet. It is provided that back dividends shall be paid before dividends are increased in excess of the standard rates. Gas of 18-candle power is to be supplied, tested by Sugg's "London" Argand burner F. The Company may apply for an Electric Lighting Order.

Mr. R. West, formerly of Aberavon, has succeeded Mr. W. Stansfield as Manager of the Hebden Bridge Gas-Works.

Mr. Lewis T. Wright, Assoc.M.Inst.C.E., whose return to England, on the termination of his engagement with the Buenos Ayres (New) Gas Company, Limited, has already been mentioned in the JOURNAL, has commenced practice as a Consulting Gas and Chemical Engineer, and scientific expert in connection with the gas industry, at No. 1, Victoria Street, Westminster, S.W.

Electrical Measurements.—The Electrical Standards Committee have issued their final report, in which are set forth the new denominations of standards for electrical measurement. The standard of resistance is the ohm; that of current, the ampère; that of pressure, the volt—all to accord with the Board of Trade verified standards deposited at the Board's Standardizing Laboratory. It is specified that, in the use of these standards, the limits of accuracy attainable are: For the ohm, 0·01 per cent.; and for the ampère and volt, 0·1 per cent.

Issue of Debenture Stock of the Crystal Palace District Gas Company.—As already notified in our advertisement columns, investors will have an opportunity to-morrow of acquiring an interest in the Crystal Palace District Gas Company; Mr. Alfred Richards having received instructions from the Directors to offer for sale, at the Mart, £15,000 of perpetual 5 per cent. debenture stock, authorized to be created by the Company's Act of last year. The stock will be a first charge upon the property of the Company, who at the close of the past half year had a reserve fund amounting to £38,638.

Death of Mr. W. Topley, F.R.S.—We regret to record the death, on the 30th ult., in his 54th year, of Mr. William Topley, who had for upwards of thirty years been an officer of the Geological Survey. Soon after leaving the Royal School of Mines, in 1861, Mr. Topley became attached to the Survey; working first among the cretaceous strata of the south-east of England, and afterwards among the carboniferous rocks of the Northumberland coal-field. He was an authority on water questions and on agricultural geology. When the International Geological Congress met in London in 1888, he was one of the local Secretaries; and the last scientific event of his life was a visit to the Zurich meeting of this body at the end of August. During an excursion to Algiers, immediately after the meeting, he was seized with an attack of gastritis, which, on his return home, proved fatal.

The Constituents of Coal.—An interim report has been issued by the Committee appointed by the British Association to inquire into the proximate constituents of the various kinds of coal. It appears that some experiments have been carried out with coal from the Hutton seam, which is bituminous, and is used as a gas coal. Heated with ether, it yields a yellow solution, with blue fluorescence. Alcohol, benzene, and petroleum ether dissolve but little from it; the solutions being similar to the ethereal solution. On this coal, acetic anhydride and glacial acetic acid have but little effect as solvents; but a solution of sulphur dioxide in glacial acetic acid, when heated at 100° with the coal in a closed pressure flask, becomes dark in colour, and on the addition of water yields a light yellow precipitate. This is soluble in ether; and the solution on evaporation leaves an oily residue. Turpentine heated in a pressure flask with the powdered coal darkens, and acquires a greenish-blue fluorescence. Aniline dissolves an amorphous solid from coal when heated with it; and the solid is precipitated from aniline by hydrochloric acid. This solid leaves resinous residues from its alcoholic and benzene solutions, and is oxidized by dilute potassium permanganate, yielding a dark brown solution, containing potassium carbonate and potassium salts of organic acids. The coal itself also reduces permanganate, and yields a dark-coloured solution, containing oxalic and other acids.

NOTES.

Photography by Incandescent Gaslight.

An exhibition of photography by artificial light is in progress during the present month in the Farringdon Avenue, under the auspices of the *Photogram*—a journal devoted to the advancement of the business side of photography. Among other systems of lighting of which demonstrations are given, the incandescent gaslight arrangement of Mr. C. F. Treble appears particularly successful. The extremely brilliant and highly actinic light of the incandescent gas-burner has enabled this experienced photographer to construct an arrangement of a comparatively small number of lights of this kind which produces good negatives with short exposure. At the experimental studio in the Farringdon Avenue, Mr. Treble has fixed up a system of seventeen incandescent gas-burners in three tiers, at different altitudes; softening the light by means of semi-translucent paper screens. This arrangement is available for photographers wherever gas is to be had, of course; and it is therefore capable of being more generally used than any system of electric lighting. The importance of the new departure thus made in portrait photography consists in the fact of this business being on the eve of a great change. Experts hold that before many years have passed the sun will be no longer depended upon for negative making. Portraits will be taken at any hour, and in any place, by means of artificial light. This is the direction which the development of commercial photography is taking; and it is felt that the introduction of the incandescent gas-burner is a great help to this end. No longer restricted to their "sky parlours," portrait photographers will be able to carry on their work amid improved circumstances, while the constancy of the new means of lighting employed will redound to the comfort of both operator and subject, while the character of the work will also be improved.

Photo-Electric Phenomena.

A curious suggestion in photometry is contained in a letter Messrs. J. Elster and H. Geitel, of Wolfenbüttel, recently appearing in *Nature*, on the subject of photo-electric phenomena. It appears that these two experimenters have been engaged in investigating the photo-electric discharge of negatively electrified bodies, with results that seem to be unknown to English physicists. It has been ascertained that well-cleaned plates of aluminium, magnesium, and pure or amalgamated zinc are, when negatively electrified, discharged in a few seconds by the light of the sun and the cloudless sky. The active rays are those extending from the blue part of the spectrum to the farthest ultra-violet, so that they are almost completely absorbed by transmission through glass. Hence a well amalgamated ball of zinc connected with Exner's aluminium leaf electroscope may be used as a photometric apparatus to settle the amount of ultra-violet radiation emitted by the sun and the sky which reaches the surface of the earth. The writers claim to have determined in this way the comparative discharging power of sunlight for a difference of altitude of 3100 mètres, and of 80 mètres above the sea-level. They found it to be twice as great in the former case. The more electro-positive a metal is, the larger the wave-length of light capable of producing a photo-electric discharge. Some photo-electric cells of high sensitiveness were, therefore, made by arranging cathodes of metallic sodium, potassium, and rubidium, arranged in a glass bulb, and dipping in an atmosphere of rarefied hydrogen. The leakage of negative electricity from a sodium or potassium surface is produced even by the light of a candle at six or seven mètres distance from the cell; and rubidium cells are even sensitive to the feeble light emitted from a red-hot glass rod.

The Action of Sunlight upon Water Microbes.

Mrs. Percy F. Frankland has contributed to *Nature* a critical notice of some experiments instituted by Professor Büchner, with the object of investigating the effect of sunlight upon the microbes found in river water. Professor Büchner admittedly had a practical purpose in view in making these investigations; and this had reference to the alleged self-purifying action of river water in the course of its flow. It was apparently determined with comparative ease and certainty that bacillus-infested samples of water, enclosed in dishes, was greatly improved in this respect by exposure to sunlight; but in all such experiments the perfectly admissible objection could be urged, that the diminution in the number of the microbes might be attributed, at any rate in part, to a process of starvation, in consequence of the absence of food material, inasmuch as a marked decrease was also observed in samples kept in the dark for the same period. To meet this objection, a series of experiments with unsterile water was essayed, providing simple support in light and darkness for the bacteria under observation. Instead of a decrease taking place in the samples kept in the dark, the numbers rose; on the other hand, in the samples placed in the sunshine, three hours' exposure in the case of the typhoid, colon, and pyocyaneus bacilli brought about their entire destruction, thus placing beyond doubt the direct bactericidal action which had taken place during insolation. Experiments made in lake water corroborated these results for shallow depths. Mrs. Frankland, however, thinks it sufficiently apparent that the action of light can only affect a very small fraction of the whole mass of river or lake water; since bacteria exist in large numbers at depths very considerably below those which insolation can embrace, whilst there are only a few months in the year, at any rate in our northern climes, when the sun's action is sufficiently strong or prolonged to produce any appreciable effect even in the upper layers of the water. Samples collected from the River Isar, above Munich, for every hour of the twenty-four, seem to indicate a preponderance of microbes during the night, as compared with the day. Mrs. Frankland mentions, in this connection, the circumstances that in the year 1866 the Thames water at Hampton contained twenty times as many microbes in the winter as were found in the summer months; and although the consideration of other agencies tending to influence the bacterial condition of the river water cannot be excluded, sunshine undoubtedly assisted in the banishment of the microbes.

The Dazzling Effect of Flashes of Light.

An interesting communication has been made to the Royal Society by Mr. Shelford Bidwell on the recurrent images following visual impressions. The earliest recorded observation of the class of phenomena dealt with by Mr. Bidwell is that of Professor C. A. Young, who published a note on the subject in 1872, and proposed to call them "recurrent vision." He noticed that when a powerful Leyden jar discharge took place in a dark room, any conspicuous object was seen twice at least, with an interval of a little less than a quarter of a second; often it was seen a third time, and sometimes a fourth. A few months later Mr. A. S. Davis published an account of two experiments on the same subject. In one of these, a piece of red-hot charcoal was waved in the air, so as to describe a small circle. A blue image of the burning end was seen following it at a short distance behind, the intervening space being perfectly black. In 1885 Mr. Bidwell showed how if an ordinary vacuum tube, illuminated by an induction coil discharge, is caused to revolve, it will be seen to be followed at a distance of a few degrees by a ghost-like image of itself, exactly like it in form, but having a uniform steel grey colour. M. Charpentier has studied the subject, and produced some new effects which Mr. Bidwell has examined. He now states, as the result of many careful experiments, that when the retina is exposed to the action of light for a limited time, the complete order of visual phenomena is as follows: Immediately upon the impact of the light, there is experienced a sensation of luminosity, the intensity of which increases for about one-sixtieth of a second, more rapidly towards the end of this period than at first. Then ensues a sudden reaction, lasting for about an equal period, in virtue of which the retina becomes partially insensible to renewed or continuous luminous impressions. These two effects may be repeated, in a diminished degree, as often as three or four times. The stage of fluctuation is succeeded by a sensation of steady luminosity, the intensity of which is, however, considerably below the mean of that experienced during the first one-sixtieth of a second. After the external light has been shut off, a sensation of diminishing luminosity continues for a short time, and is succeeded by a brief interval of darkness. Then follows a sudden and clearly defined sensation of what may be called abnormal darkness—darker than common darkness—which lasts for about one-sixtieth of a second, and is followed by another interval of ordinary darkness. Finally, in about a fifth of a second after the extinction of the external light, there occurs another transient impression of luminosity, generally violet coloured, after which the uniformity if the darkness remains undisturbed. This is the completest statement of the physiological and optical phenomena known as the dazzling effect of sudden and strong lighting, that has hitherto appeared. It can be tested in connection with the arc lighting of streets.

The Utilization of Town Refuse.—At the meeting of the Society of Engineers on Monday evening last week (Mr. G. A. Goodwin, President, in the chair), a paper was read by Mr. T. W. Baker, B.A., on "The Utilization of Town Refuse for Generating Steam." The refuse to which the author of the paper referred is the usual contents of the ashbin, with street sweepings and sludge, which is collected by the various local authorities, and the disposal of which has been for years a growing source of expense. The recognized means of dealing with it is now by fire—thus destroying all germs of disease; and the heat set free by the process, the author showed, by reasoning from his own experience and that of others corroborating him, could and should be utilized. He said the large bulk of 420 tons per week, collected from an average vestry area, necessitated a special furnace or destructor; while the noxious fumes arising had also to be destroyed. Up to the present time this had been imperfectly and unsatisfactorily done; most of the heat having been allowed to go to waste. The author submitted his new system as efficiently meeting the difficulties; and the results deduced from his calculations and experiments showed that, after paying for the plant, working expenses, depreciation, interest, and redemption, a net saving of £2666 per annum could be obtained on a plant capable of dealing with the quantity above referred to. The author claimed that his scheme is particularly applicable to the generation of electricity by steam; providing a means for heat storeage to meet the well-known fluctuation in demand. Diagrams of the system were shown; and the sanitary and hygienic requirements were fully dealt with.

TECHNICAL RECORD.

NORTH OF ENGLAND GAS MANAGERS' ASSOCIATION.

Half-Yearly Meeting in Durham.

The North of England Gas Managers' Association held their thirty-fifth half-yearly meeting at Durham on Saturday last. The President for the year is Colonel Sadler, J.P., of Middlesbrough; and the meeting, according to custom, should have fallen to be held there. Two reasons operated against this course being taken. First, that the meeting last October was held at Middlesbrough—Mr. D. Terrace, the Gas Engineer and Manager there, being President; secondly, that Colonel Sadler was desirous of showing the members his coking plant, on the Simon-Carvès system, that has been introduced at his collieries at Malton, for which Durham was the most convenient starting-point. On account of the novelty of the process, which only a very small proportion of those who were present on Saturday had seen before, there was a more than usually large attendance of members. The place of assembly was Durham Railway Station, where refreshments were served. Carriages, provided by Colonel Sadler, being in waiting, a start was made about midday upon the seven-mile drive to the colliery. This, though the day was dull, and rain occasionally threatened, was a very pleasant experience; the valley of the River Browney, along which the route lay, being one of considerable beauty.

Visit to Malton Colliery—The Simon-Carves Coke-Ovens.

Arrived at the works, the company found themselves taken possession of by Colonel Sadler and his assistants, who vied with each other, not only in showing all that was to be seen, but in explaining every process. It is safe to say that what is ordinarily the drawing, but in this case is the expelling, of the coke from the oven, or retort, was a surprise to everyone. The process was so interesting, and there was so much to see, without going into details, that before the inspection had been accomplished, and the company had again had the offer of refreshments, the business of the day was about an hour behind the programme. Before leaving Durham, the following brief description of the works was distributed among the company:—

The ovens, residual, and chemical plant are designed by the eminent engineers, Mr. Simon and M. Carvès, and cost £32,500. They are the largest ovens of the kind that have ever been erected. Each oven carbonizes 5 tons 10 cwt. of coal every 48 hours, and each charge yields 4 tons 5 cwt. of coke. The coal is finely crushed, and elevated into a large hopper, which holds 500 tons. From this bunker the coal is conveyed in waggons by railway, running along the top of the ovens, and charged through openings on the top. A locomotive steam-ram runs the whole length of the ovens, and thrusts the coke out on to the bench in front, alongside the sunken railway. The gases are drawn from the ovens through a hydraulic main of novel construction. The large building in the centre of the works contains engines, exhausters, and pumps. The tar and liquor are condensed out of the gas in a large serpentine, cooled by a water-spray. The gas is then passed through a number of scrubbers, the first portion of which extract any remaining ammonia; and in the second portion, including an ingenious bubbling arrangement, the benzols and naphthas contained in the gas are washed out by oils. The gas is then finally treated with sulphuric acid for the last traces of ammonia, should any be left in. It then passes back to the ovens, and is employed to heat them. The air required to burn the gas is heated red hot before it comes in contact with it, by superheater flues under the coke bench. These flues are heated with the waste heat from the ovens, as are also the four large steam-boilers, which work at 100 lbs. pressure. The tar, when separated from the liquor, is pumped into a large elevated tank, from which it flows into railway tank trucks, to be sent away. The ammonia liquor is also passed into a large elevated reservoir, from which it flows direct into one of Mr. Simon's admirable patent ammonia stills, and made into sulphate of ammonia, in the ammonia-house. The oils that have become charged with benzol in the scrubbers are pumped into a raised store-tank, whence they flow direct into the stills in the benzol-house, and are subjected to distillation by steam. The benzol is also sent away in railway tank trucks.

By way of supplement to this, it may be stated that, roughly, the works resemble the letter H. One leg is the retort-bench, with the coal-crushing and elevating machinery at one end. Half-way along, the bench is cut in two by a through passage, on each side of which are the boilers for generating steam, which are also heated by the gas made in the process. The ovens or retorts are 70 in number. They are "through and through." The length is the width of the bench—about 20 feet; the width of each retort is 20 inches; and the height of the interior, about 6 feet. Each end is closed by a luted iron mouthpiece, which is more of a door than a lid. The ascension-pipes are on the top, beside the hydraulic main, which runs along the centre. In the process of charging, all that is necessary, besides the emptying of the hoppers into the openings on the top of the bench, is to level the coal in the interior, which is done by long rods. Two retorts were emptied while the party were present. The process is a beautiful one. The doors having been removed, the steam-ram is run up on one side opposite the retort, and power applied, when the glowing coke, like a wall of fire, slowly emerges at the other side of the bench. When it is all clear of the bench, it crumbles into large lumps on the fire-brick stage, and workmen with water hose at once commence to quench it. Not until this has far progressed can the workmen approach to replace the door; but when this is accomplished, the retort is at once re-charged—the whole process only occupying probably about half an hour. Returning to the letter H, the exhausters are situated in the other leg of the letter, about the middle. Without being precise (for this leg is more straggling than the other), the condensers, which are horizontal, and are played upon by water, the scrubbers, the tar and oil stores, and the benzol-house, form the one end; while the sulphate-house forms the other. There are details in working which it is not possible to describe here; but everything is simple, and under the control of the workmen. An instance may be given. In the benzol-house, the stream of benzol as it leaves the still flows through a glass tube; and the man in charge can see at a glance if his plant is working. The works produce 1200 tons of coke per week. The coal which is used is of high quality, but is so friable that only 20 per cent. of it is round enough to be sent into the market. It is therefore eminently adapted for treatment by this process, on account of its being easy to crush. The yield is nearly 20 per cent. more coke than is obtained from the ordinary beehive coke-oven; and residuals in such quantity and of such quality that the price received for them is nearly equal to the value of the coal. The coke, though not so bright in appearance, is said to be of higher calorific value than ordinary coke; but there is, naturally, not agreement upon this point. No fuel is required anywhere about the works except the gas, of which there is sufficient developed to heat the secondary air and the ovens, and to allow about 35 per cent. over, part of which is used to light the works. The remainder, in the absence of any means of utilizing it near the premises, is simply burned away; but, if it were desired, it could, of course, be stored, and used for illuminating purposes.

The inspection over, the company drove back to Durham, which was reached shortly after three o'clock.

The Meeting.

The meeting of the Association was held in the Board-room in the Durham Gas Company's Offices. Colonel Sadler took the chair, and had on his left Colonel Rawlinson and Mr. John Willan, Directors of the Company.

Colonel Rawlinson said that, on behalf of the Company, he and his colleague wished to welcome the Association to Durham that day. They were sorry they could not do anything more for them than allow them the use of that room; but the Association had gone on the principle of self-help, and had provided for themselves all that was necessary. The Directors were glad, however, to see them there, and hoped they would learn something from them. He might mention that their Chairman, Dr. Boyd, was unfortunately laid up, and could not be there, or he would have heartily welcomed them; and that their Vice-Chairman, Mr. John Cowen, was away on business.

The President intimated that he had recived telegrams from several members and associates who had been unavoidably prevented from attending; and, besides, he had a number of letters from gentlemen in other districts who had been asked to take part in their meeting, regretting their inability to be present.

New Member and Associates.

The following gentlemen were admitted to the Association:—

Member.—Mr. M. Dunn, Manager of Gas-Works, Selby.

Associates.—Mr. R. Dale, Secretary of the Durham Gas Company; Mr. Herbert, Manager of the Birtley Iron Company; Mr. Drake, Gas Engineer, Halifax; Mr. N. S. Dodds, Engineer, Newcastle; and Mr. H. A. Raine, of Messrs. Ferens and Lore, Durham.

Prepayment Meters.

The Hon. Secretary (Mr. W. Hardie, of Newcastle) said he had received a letter from Mr. H. Wimhurst, the Secretary of the Eastern Counties Association of Gas Managers, regarding prepayment meters (see *ante*, p. 242).

Mr. W. Ford (Stockton) proposed that the letter should be placed on the table for the consideration of the Committee. He said the matter was one of some importance, and he thought their esteemed Secretary might call the Committee together to consider it.

The subject was left in the hands of the Committee.

The President's Address.

The President then delivered the following

INAUGURAL ADDRESS.

Gentlemen,—My first and paramount duty is to express to you my hearty thanks for the unsought honour you have done me in making me your President. I appreciate the compliment very highly. I feel that it is no common distinction you have conferred upon me when I remember that, although I have been connected with your successful Association ever since its formation, eighteen years ago, I do not forget that my place has been in the outer temple only, as an associate. Advanced biological philosophers have propounded the astounding hypothesis that, by a transfusion of blood from one person to another, the teeming millions of new microbe life thus imparted may so entirely alter the character of the individual that his thoughts, opinions, tastes, and even pursuits, are completely changed. Although I do not remember the operation having been performed, something of the kind must have happened to

me thirty years ago, for the course of my life and pursuits were then completely changed from a very dissimilar direction in an otherwise inexplicable manner; and since that time until to-day, my life and daily vocations have been associated with coal gas and its bye-products. Although not a gas engineer, manager, or gas expert, my claims to being a gas maker are of no mean pretensions. Let me hasten to explain. I do not refer to oratorical "gas" of poor illuminating power which, in my numerous public capacities, I have for many years retailed in too bountiful quantities to long-suffering audiences; nor, indeed, to that gas of more pungent and permeating nature which I have gratuitously distributed to unappreciative and unadmiring neighbours from our several chemical works. But for many years—nearly twenty—I have carbonized from 20,000 to 25,000 tons of coal per annum in ordinary gas-retorts; the gas being employed for purely chemical purposes. I mention this because some of my friends, unaware of the circumstances, wonder by what right or title I could justify my acceptance of the honourable position in which you have placed me.

Your trade is well off for literature; and it is intelligently and admirably served by its journals. Gas making is now a recognized profession; and it is conducted on purely scientific lines. Your profession abounds with able and thoughtful men, who generously and ungrudgingly give their brethren the benefit of their learning and experience. There is no question affecting the industry, whether chemical or technical, that is not almost weekly discussed. It is therefore difficult to say anything interesting, and more so to say anything new, in connection with gas. I had intended to contrast the present position, from a chemist's point of view, with that of thirty years ago. But this has been strikingly set forth in recent numbers of the JOURNAL OF GAS LIGHTING; and there is little to add.

The value of chemical knowledge in conducting a gas-works has not been recognized until very recent years. No industry of this magnitude has ever continued so long in a groove of self-satisfied ignorance of the scientific principles underlying the process. Prejudice against any proposed improvement in manufacture, and the mysterious secrecy affected by some, seriously prevented that progress which can only come from scientific knowledge. Nothing brings out the qualities and capabilities of men better than competition and rivalry. The latter was probably the first incentive to inquire below the surface for information and light. When it was found, by published reports, that one gas maker obtained better returns than another, the spirit of emulation awoke, and improvements at once became manifest. But the advent of the electric light, and the serious competition from it, was the talisman that aroused the latent abilities of gas engineers. The amazing rapidity of inventions, improvements, and economies in gas manufacture during the past fifteen years speaks volumes for the ability and enterprise of those connected therewith. Perhaps one of the best illustrations of the rapid advance made will be found in the great improvement in the light to be obtained from gas. This is, to my mind, quite as much seen in the modest, but ingenious, little batswing or fishtail burner, as it is in the more assertative and imposing lamps for open places, which all the same redound to the credit of the successful inventors and manufacturers who specially produce them. In my opinion, the youngest child in this family—the "mantle" or incandescent burner—bids fair to be the most robust of all, for chemically, economically, and sanitarily there is much to recommend it. I was forcibly struck with the beauty and effectiveness of the light a week or two since in Paris, where that magnificent square, the Place de la Concorde is wholly lit by it. It looked superb.

Until a comparatively recent period, the constitution of coal gas was not generally known. As soon, however, as it was seen how small was the percentage of the whole of that part which contributes to the illuminating power, various expedients were devised to increase it; and what is now commonly known as "carburetting," in one form and another, found at once a place in the manufacture. The use of cannel is the oldest form of carburetting. Rich in bituminous matters, on destructive distillation the hydrocarbons pass with the gas both as permanent gas at ordinary temperatures and as vaporized liquids at great tension. Paraffin and petroleum ethers are simply refined forms of cannel enrichers, since their capacity for the work is due to the same class of hydrocarbons as those derived from cannel or other schistous coal. The most natural, and, at present prices, the most economical carburetter is undoubtedly benzol. I say the "most natural," because from 70 to 75 per cent. of the illuminating power of ordinary gas produced at high temperatures is mainly due to benzol. Then the source of all benzol in the market is tar or gas itself. As gas rarely contains more than 2 per cent. of benzol, it will be seen what a potent illuminating agent it is. It is reported that The Gaslight and Coke Company have decided to use for carburetting any benzol they produce, unless it can be sold at 1s. 3d. per gallon. But I claim it to be the cheapest enricher even at 2s. 6d. per gallon. To the richness of benzol in carbon is doubtless to be attributed its value in this direction. In that light, one cannot but contemplate what a fine field of usefulness is open to that substance which is now a scourge to both gas makers and tar distillers. Needless to say, I allude to naphthalene. Extremely rich in carbon, *if* it could be distributed—and that is only a question of temperature of the mains—and *if* it could be completely "combusted," which is merely a question of the supply of oxygen, it would be the perfection of enrichers. There is "much virtue in an *if*," surely.

Reverting to benzol as a carburetter. Ordinary gas at normal temperatures will easily carry 3 per cent.—this being nearly the point of saturation. Now, as average gas contains less than 2—often only 1·5—per cent., 1 per cent. may be added with great advantage where increased illuminating power is desired. An addition of 1 per cent. will raise 14-candle gas to 22-candle power, which, at to-day's price of crude benzol, would cost about ½d. per candle. For enriching gas, benzol is three times better than carburine, and four-and-a-half times better than ordinary petroleum spirit. If all the gas made in the United Kingdom were enriched by 1 per cent., it would require 11,500,000 gallons of benzol to do it—a quantity more than twice as great as the whole world's yearly production. When gas contains an admixture of other gases besides hydrocarbons—hydrogen, carbonic oxide, and nitrogen, for instance—the absorbing power for benzol is enlarged. It is therefore a matter of calculation and management whether it will pay to extract more gas from the coal in the retorts, even supposing it be carbonic oxide, and make up the luminosity with benzol. So-called water gas takes up benzol with avidity. It is worth bearing in mind that carburetted gas, whether with benzol, petroleum spirit, or light hydrocarbons from cannel or from oil gas, will dissolve readily any deposited naphthalene in gas-mains and also in gas-fittings.

The importance of the application of benzol to enriching gas appeals to us in this—that it will utilize the surplus beyond that required for the manufacture of aniline. The magnitude and rapidity of the increase in the production of benzol and its homologues during the past ten years is remarkable. It is difficult to obtain reliable figures; but I think I am near the mark when I say that this year's output will be upwards of 4,000,000 gallons, while ten years ago it was under 1,500,000 gallons. It is marvellous how so large and rapidly increased an amount has been absorbed by the market; and, having regard to the depression of the textile trades for several years, it is difficult to believe that the large quantities of anilines represented by the great production of benzol could have been required. Unquestionably, lower values have opened up outlets which were impossible before.

It takes one's breath away to remember that benzols were realizing ten years ago 15s. per gallon, while to-day's net value "naked" is less than 1s. It is right to add that previously, in the early seventies, the price was no better than it is to-day. It was about that time, as well as in the infant days of our Association, that I strongly advocated the application of benzol for raising the illuminating power of gas; and for many years Mr. Verini, of the large Zetland Hotel, Saltburn, recognizing its value in this way, passed all the gas consumed in the hotel through an ingenious spiral arrangement in a closed circular box, the inner partitions of which, being made of flannel, sucked up the benzol by capillary attraction, and in this attenuated state it was rapidly imparted to the passing gas. The simplest and cheapest carburetter (for its efficacy I can vouch from long experience) is to pass the gas over the surface of benzol which is slightly heated with a steam-coil in a small closed tank of any kind.

The prodigious, and I fear ever-increasing, production of benzol, and the certainty of lower prices, must be my excuse for appealing to gas managers to use it in preference to, or mixed with, other carburetting agents. In doing so, the value of tar will be improved, and over-production will disappear. Moreover, it is the cheapest and most natural fortifier. I admit that this is special pleading; and I regret that the occasion necessitates it. I confess all the same to feeling like a base ingrate, in humiliating to such commonplace and menial work a product of vast chemical importance, which has been one of my best friends, as well as of many other chemical manufacturers.

The benzene molecule, as the chemical combination of 6 atoms of carbon combined with 6 atoms of hydrogen is called, is one of fascinating interest to the chemist. Like many another, I fell over head and ears in love with her in my too susceptible youth. How ardently I wooed her, in my young enthusiasm, for her brilliant qualities! How often I thought she slighted me for more pressing admirers! How I waited for her, and she did not turn up—the trysting spot being the odorous and sequestered shades of the laboratory! How I sought for her in impossible places! How I worshipped her when she sometimes capriciously turned up unexpectedly! How I importuned and pursued her and pressed my suit when she was not disposed to stay with me! How I was stricken with her marvellous attributes! How I was dazzled as she suddenly appeared to me in rainbow hues! How I sighed for her to return when, a little heated, she suddenly assumed invisible form! How, in short, she was my ideal and adored Molly Cule, worth 10s. per gallon. How I found out, on more intimate acquaintance, that the benzene molecule—this foremost member of the aristocratic aromatic family—was, I regret to say, a loose character! Although legitimately united to several atoms of hydrogen, she was not averse to exchanging them for other atoms, or even for combinations of atoms, of a hybrid formation and character. It is not surprising, after such shocking lapses, that she stooped to subterfuge and deception. She dropped her name with the Oriental prefix, and shamelessly assumed rakish titles and fancy designations

—such as Toluol, Xylol, Phenol, Mirbane, Aniline, Rose-Aniline, Induline, Saffranine, Leucoline, Recorcine, and scores of others. It is said that "a rose by any other name would smell as sweet." But she, with the first change, as Nitro-Benzol, became intensely fragrant; then, with subsequent divorces and unions, she affected the most brilliant garb—now vieing with the rising crimson sun, then with the azure sky. Indeed, neither the rainbow nor any flower of the garden, however intense in colour, can compare with the marvellous hues and variety she adopted. This moral turpitude, or loose affinity of the atoms constituting the benzene molecule, returning to practical language, is of incalculable usefulness in the arts for synthetic purposes; benzol being the most prolific source of synthetic products at the command of the chemist.

The most glorious chapter in chemistry—indeed, it reads like a romance—is that commencing with Faraday's discovery and isolation of benzol, and subsequently its chemical relation to benzoic acid, a natural product; the revelation of its properties by that martyr to the science of tar chemistry, Mansfield (who was burnt to death in the laboratory while investigating the products of tar, and whose name is held in grateful memory), and the classic researches of Laurent, Runge, Hofmann, Perkin, Caro, Graebe, Liebermann, and Baeyer, resulting in the discovery of a great number of interesting, useful, and elegant products, all owing their existence to the benzol molecule.

The other tar products have not increased in anything like the same ratio as benzol; the great production of the latter being largely due to its extraction from coke-oven gases. One-third of the total make comes from this source. The quantities, however, are astonishing, especially as they are now considered as a necessity of modern civilization and trade, and having regard to the fact that thirty years ago few of them were commercial commodities, while many were unknown beyond the precincts of the laboratory. Carbolic acid, or oxy-benzol, and its step-brother cresylic acid, were just becoming recognized as valuable disinfectants; my old friends, Dr. Smith and Mr. Crookes, having employed them, with miraculous results, in suppressing the great cattle plague—the rinderpest. Now, in the language of advertisement, "no well-conducted household should be without it. It is the best of all disinfectants!" The most powerful explosive now known, melinite, an admirable smokeless powder, and several of the most charming dyes, owe their origin to its parentage and mobility.

Creosote, including naphthalene, and the heavy tar oils, the annual make of which is little short of 100 million gallons, are now important articles of commerce; being of great recognized utility for protecting wood, preparing lubricants, and lighting open spaces in the special lamps now extensively employed. Useful as they are, they are nevertheless made largely in excess of the world's present requirements—the surplus being utilized as fuel. More than twenty years ago, I passed these oils through highly-heated tubes, to convert them into more valuable bodies. The phenoloid hydrocarbons, readily decomposed into benzols and anthracene; and the other hydrocarbons furnished a large yield of gas of high luminosity, which we mixed with ordinary gas for use on the works.

My firm has used many millions of gallons of tar oils as fuel; and I am sure it will interest you to hear what is the economic caloric value of them when burnt under suitable conditions. A good many years ago, I invented a simple and costless burner for tar oils, which neither the scores whom I have supplied nor I have much reason to desire to improve; and I will give you the result of our experience with it. Of course, the density of the oil affects the results; but, taking average creosote, I find that 1 lb. will evaporate, in a well-constructed and properly-set steam boiler, 13 lbs. of water at 100 lbs. pressure. The Government dockyard for a time used all the creosote produced at our Portsmouth works; confirming this result. The experiment was made with the view of testing the adaptability of creosote as fuel for ships of war; but the difficulty of getting supplies, excepting at a few ports, prevented its adoption. Its compactness compared with coal—one part being equal to two parts of coal—and no stoking or labour being required, were, and are, strong factors in its favour.

Anthracene is the most beautiful of all the tar products—in its pure state showing a dazzling opal fluorescence—as well as the most valuable of them. Unfortunately, it only enjoys a limited market, and has, so far, but one use—the manufacture of alizarine, or Turkey red. My firm has spent £130,000 in an endeavour to utilize the anthracene made in this district, instead of its being sent to Germany, converted into alizarine, and returned here for use by our dyers.

Something like 50 per cent. of ordinary tar is pitch, the great bulk of which is used for briquette or fuel making by mixture with small coal. The development of this particular trade is truly wonderful. Twenty years ago it was a comparatively small industry; whereas to-day the annual output of briquette fuel made with pitch is upwards of 4 million tons. The steady flow of pitch in the present market channel presents a vivid contrast with the strange devices and expedients adopted five-and-twenty or thirty years ago to dispose, "by hook or by crook," of this then unsaleable article. I remember moulding it into bricks, and baking it into coke in specially constructed ovens—a laborious and unprofitable pursuit, which "eventuated" in my running the hot pitch *en masse* into large ovens, firing, and thus coking it. A refractory pure coke is thus obtained. Pitch is now admitted to be the best and most economical agglomerating agent available for fuel; and at the present time it enjoys the distinction of being the only tar product which is not produced in excess of its requirements, though, with the continuous fall in the value of coal, I see no prospect of this advantage being long retained.

I must not close my address without saying something about sulphate of ammonia. Financially, it gives the best yield per ton of coal carbonized; and, though lacking the charm and attractiveness of some of the tar products, it is nevertheless equally interesting, in the utilitarian sense, because of its intrinsic value. The world's available production this year will probably be 235,000 tons; while ten years ago it was less than 100,000 tons, and twenty years ago about 35,000 tons. Sulphate of ammonia owes its value not only to the nitrogen it contains, but to its remarkable adaptability to agricultural purposes. The great increase in the manufacture of sulphate is a source of anxiety to many makers who have not taken the trouble to contrast its production with the world's actual and growing necessities for nitrogenous manures. Education, technical training, and the wide diffusion of scientific knowledge, will soon call for far larger quantities than can be made, especially when it is thoroughly understood how much more valuable is the nitrogen in sulphate than that contained in nitrate of soda. Then remember that the annual production of nitrate is 1,250,000 tons, while that of sulphate is less than 250,000 tons. There is room not only for all the sulphate now being made, but for any, no matter how much, that will ever be made. The world will be richer for every added ton of sulphate placed at the disposal of farmers.

A word or two about the coke-ovens you have seen to-day at my colliery, and I have done. They may have a far-reaching influence on your industry. In the first place, some day—perhaps soon—they may prove to be the best means of making gas, as they certainly would be the cheapest and most wholesale way of doing it. After all, they are just a gas-retort on a larger scale, carbonizing 5 tons of coal each charge. Secondly, the ovens yield 2000 tons of tar, 650 tons of sulphate of ammonia, and 100,000 gallons of crude benzol per annum. At a moderate computation, 30 million tons of coal are coked in the United Kingdom in ordinary ovens. If this coking were done in closed ovens, and the residuals saved, the produce would be: Tar, 1,000,000 tons; benzol, 50,000,000 gallons; sulphate of ammonia, 300,000 tons. As showing how slow we are, there are 300 ovens of this class in England, while there are 2650 on the Continent, and many more in course of construction there. Fortunately, the yields from the latter are much lower; the coal being less bituminous. Still the quantities of bye-products from them are a factor to be reckoned with. When it is remembered that these ovens give at least 15 per cent. more coke from the coal than is obtained from the old type of ovens, and further that the worth of the residual products may be almost as much as the small coal used, the prejudice which prevents their universal adoption is stupid and beyond comprehension; but, taking the enormous loss to the country, it is worse—it is wantonly wicked and suicidal. My friend Mr. Simon, of Manchester, one of the most eminent and most successful engineers of our time, has for years endeavoured to impress on English coke makers and metallurgists the immense importance of this question. The perfect arrangements you have seen to-day are largely due to his inventive skill and enterprise. After years of discouragement from sources where enlightenment and science had a home, and whence something very different was expected, the great merits, advantages, and economies of the ovens and plant, which will stand as an enduring monument of the ability and genius of Mr. Simon and M. Carvès for all time, are at last being recognized, and will rapidly occupy that place in the industries of this district far too long delayed.

Mr. T. TREWHITT, J.P. (West Hartlepool), said he was sure the members were all highly pleased with the President's address, which had not only been a most valuable exposition of manufacturing plant for gas and residuals, but also contained material for a very large field of research in various other ways. It was sincerely to be hoped that every member of the Association would carry home the address; * read it carefully, and make notes for himself, because he was sure that all the young members would learn much from it, and that the older ones would greatly benefit by it. He moved a vote of thanks to the President for his address.

Mr. J. HEPWORTH (Carlisle) said he had pleasure in seconding the proposition; and it was a very easy task, because he knew he had the heart and sympathy of everyone behind him. He thought that in the entertaining address to which they had listened there was a great deal that would be of use to them, when they considered it in their quieter moments. There were points—and especially that with reference to enrichment—for which, as well as for a great many others he could not express in that resolution, he felt he must thank Colonel Sadler.

The PRESIDENT, in acknowledging the vote, said he thought the members had appreciated at too high a value his poor effort.

This concluded the business of the meeting.

* A copy of the address had been courteously supplied by the President to everyone in the meeting.—ED. J.G.L.

The members and their friends were afterwards entertained by Colonel Sadler to dinner in the Rose and Crown Hotel. After dinner, the usual loyal toasts and the toast of the day—"Success and Prosperity to our Association"—having been duly honoured, "The President" was proposed in an exceedingly happy speech by Mr. Charles Sellers, of York, and was most cordially received. The other toasts on the list were "The City and Trade of Durham," and "Our Visitors." A glee party from the choir of Durham Cathedral, who were present on the invitation of Colonel Sadler, furnished excellent music during the proceedings. The company broke up shortly before seven o'clock; all acknowledging that a most profitable and pleasant meeting had been provided for them by the President.

GAS FIRING FOR BOILERS.

There has lately been some correspondence on this subject in the *Mechanical World*, which has brought out several interesting points. In the course of a letter by Mr. T. Nicholson, he stated that he had been able to evaporate 12 lbs. of water with gas generated from 1 lb. of coal in a gas-fired boiler. In reply to this, Mr. Shaw says the best results he has been able to obtain are 9·25 lbs. of water per pound of coal converted into gas, in a double-flued boiler 29 feet long and 7 feet in diameter, without cross tubes; and, to obtain this result, the evaporative power was reduced to 450 gallons per hour—the usual work of the same boiler being 520 gallons per hour with hand firing. He considers the proportion 9 : 1 very good for gas firing; but, in his opinion, economy of fuel is not the main point, as there are several others of equal importance—one being the lasting quality, or "life," of the gas-fired boiler as compared with the hand-fired one. It is a well-known fact, he says, that the opening and shutting of the fire-hole door during the operations of firing and clinkering are very detrimental, and expand the rivets of the flues. The intense heat of the furnace end is also very trying to the crown of the flue. In the case of a gas-fired boiler, all this is avoided; the doors, while the boiler is working, being always kept closed—thus doing away with the expansion and contraction of the tubes and plates. The flame is also more evenly distributed—extending as it does to nearly two lengths of the boiler. There is no doubt that the life of a gas-fired boiler is double that of one fired in the usual way. Another point is the difference of the quality of the fuel used—common slack or smudge being utilized in the producer; while for hand firing, coal or engine slack is necessary to obtain good results. The last, but to Mr. Shaw's mind the greatest advantage, is the entire absence of smoke in gas firing; the whole of the combustible properties of the coal being burnt to advantage in the boiler. Mr. Nicholson, in his reply to this letter, says he thinks Mr. Shaw has not been so successful in regard to evaporation as he might have been. But he adds that this can be easily understood. He points out that gas never is, and never can be, given its natural conditions when burnt in a boiler furnace. The plates cool it down too much, and for a space of some inches from them there is always a quantity of unburnt gas rushing away to the chimney in waste. The air supply, too, is cold and insufficient. Gas requires ten times its own volume of air for perfect combustion, at a temperature of (say) 500° Fahr. Perfect combustion is shown by absence of flame. He says if anyone will burn gas without flame, he will find not only an absence of smoke, but results that will astonish him. Citing the fact that gas from 1 lb. of coal will smelt as much steel as 3 lbs. of coal, he expresses astonishment that manufacturers have not taken some steps to find out how to effect the same economy in the generation of steam. "Surely," he remarks, "it is logical to suppose that the superiority of gas over coal for smelting steel must also exist for boiling water."

Awards at the Antwerp Exhibition.—Among the awards granted to exhibitors in the British Section at the Antwerp International Exhibition, we notice the following: *Diplomas and Medals of Honour*—Chance Bros. and Co., for lighting apparatus; W. and B. Cowan, for gas-meters and also for checktills; Tangyes Limited, for gas-engines; C. Wilson and Sons, for gas heating apparatus. *Gold Medals*—P. Burt and Co., for the "Acme" gas-engine; Bryan Donkin and Co., Limited, for gas machinery; Dowson Economic Gas Power Company, for gas-making plant; Fielding and Platt, for gas motors; Glenboig Union Fire-Clay Company, Limited, for fire-bricks and gas-retorts.

Testing for Ammonia with Litmus.—Writing to the *Bulletin* of the French Chemical Society, M. Henry describes an improvement he has introduced in the process of estimating ammonia in gas liquor or other fluid containing sulphur or cyanogen, with litmus as an indicator. In this case, inconvenience is caused by the decolorization of the litmus by hydrosulphuric and hydrocyanic acids, which, notwithstanding the presence of alkali in excess in the retort, come over with the ammonia, and dissolve in the standard acid during the process of distillation. To overcome this trouble, M. Henry adds basic lead acetate to the ammoniacal liquor to be analyzed; and this precipitates the fixed and volatile acids.

REGISTER OF PATENTS.

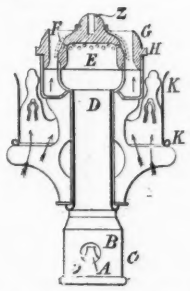
Utilizing Heat Obtained by the Combustion of an Intimate Mixture of Air with Gas or Inflammable Vapour.—Smethurst, W., Vickers, W. E., and Rogers, G. R., of Victoria Street, Westminster. No. 18,743; Oct. 6, 1893.

Alluding to their invention, the patentees say: For many different industrial purposes, where great and uniform heat is required, the high temperature obtained by the complete combustion of an intimate and perfectly proportioned mixture of air and gas is most effective; but where such mixture is employed, it is absolutely necessary to take sufficient precautions in order to prevent the flame from passing back in the burners, and entering the tubes through which the mixture is conveyed, if at any time the pressure by which the gas is forced along should be reduced or should cease. The system of conducting pipes, and the method of utilizing such an intimate mixture of gas and air may, however, be perfectly safely effected, even if the dangerous point be closely approached, by taking advantage of the property possessed by metallic gauze, perforated plates, and the like, of absorbing heat—that is to say, by providing the pipes and passages with a sufficient number of transverse partitions held together, and sufficient in number, and in their size and method of arrangement, to prevent all risk of firing on their inner side or the side opposite to the burners. The burners are constructed upon somewhat the same principle; generally approaching in arrangement the form of injectors of variable size of jet, or that of the blow-pipe commonly used. These burners concentrate the heat in a space as restricted as possible, in order to develop the maximum of calorific intensity at the point where it is wished to utilize the effect of the combustion. They may, however, be made to take other form, provided only that they always have wire or metal gauze, perforated plates, or the like, in order to prevent the flame from passing back from the burner along the passages.

One form of the apparatus consists of sheets of metallic gauze, perforated plates, or a like device, by which the inflammable mixture is broken up and made to pass through a sufficient number of very fine apertures or spaces in material of high heat-conducting capacity, by which the heat is absorbed so rapidly that the temperature necessary to combustion cannot be attained. Further, as the patentees have found, if the transverse area of the passages through which the combustible mixture is passing is properly proportioned in relation to the length of such passages, and to the speed at which the mixture is flowing through them, the passing back of the flame is prevented, or its probability very greatly lessened. For this purpose they reduce the diameter of the conducting-pipe at one or more parts of its length (for not less than about 12 inches) to an internal diameter of not more than about ½ inch; and such reduced pipe is provided with transverse diaphragms of wire gauze.

Atmospheric Gas-Burners for Incandescent Lights.—Elster, J., of of Berlin. No. 20,407; Oct. 28, 1893.

This invention relating to atmospheric gas-burners, has for its object to so construct Bunsen burners that objects may be exposed "to a most effective flame of tubular form." Argand burners with fine issue-jets have, however, the disadvantage that a great number of jets (necessitating a large circumference) must be provided, if a considerable volume of gas is to be burnt, since, if larger issue-jets be provided, the lighting-back of the flame is not easily prevented. But by the present invention this is prevented, notwithstanding the large area of the gas-jets, by covering the top or head of the burner E with a gauze cap F. The gas-jets are arranged in one or more circles on this head; and the gauze cap is secured to a projection Z on the head, by a ring or by other suitable means. The object to be heated is put upon the rim G of a fire-proof shell or ring H, which is carried by the chimney-holder K, and which at the same time causes the gas-jets which escape from the holes of the top in an oblique direction to turn upward. If desired, the object to be heated can be supported by a rod, secured to the projection Z on the head of the burner. After the mixture of gas and air has escaped from the holes in the top, and has passed through the wire gauze, a further quantity of air is brought to that mixture, which ascends between the head and the shell or ring. The air is thus forced upward by the draught due to a chimney, which is carried on an ordinary gallery K.



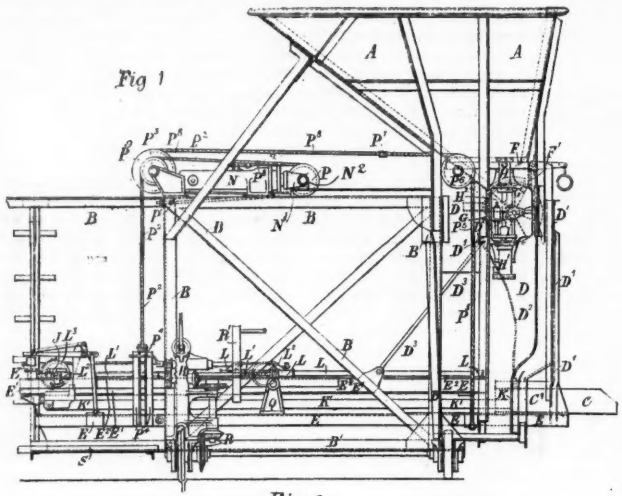
The action of the device is as follows: The gas flows out of the opening or nozzle A in the supply-tube C, and is then mixed with air drawn in through lateral openings B. The mixture ascends in the burner-tube D to the head E, and escapes therefrom through a large number of jets in the burner top. The jets of gas form a conical surface, and are somewhat dispersed by the gauze cap F over the head. The lower air stream now meets the cone of jets; and at the same time the jets impinge against the shell or ring H surrounding the head. Both those influences combine to turn the gas-flame in an upward direction; so that at the ring G a tubular flame is formed, which, if kept together by the heated object, has its hottest zone perpendicularly over the annular slit, between the head of the burner and the cone or ring.

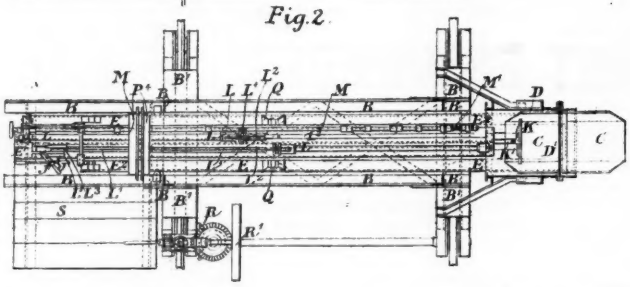
Charging Gas and other Retorts.—Arrol, Sir W., and Foulis, W., of Glasgow. No. 16,749; Sept. 6, 1893.

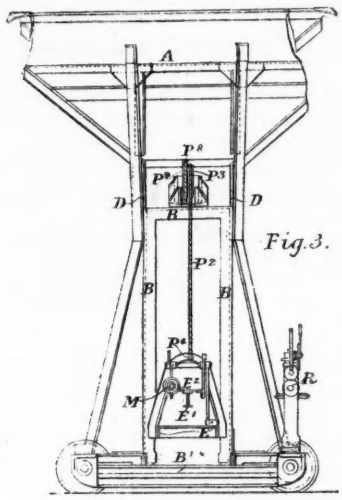
This invention relates to improvements in apparatus for charging gas and other retorts, and forms additions to, as well as modifications of, the apparatus described in patent No. 14,440 of 1891.

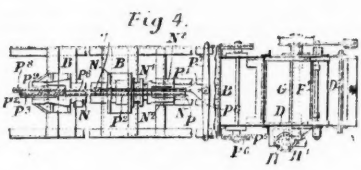
Fig. 1 is an elevation of the apparatus; fig. 2 a sectional plan; fig. 3 an end elevation; and fig. 4 a part sectional plan.

The hopper or chamber A for the coal to be fed into the retorts is mounted on the top front end of the carriage framework B, in such a manner as to be stationary in relation to the machine; and therefore it does not require to be raised and lowered as hitherto. In order to lead the coal from the hopper to the shoot or delivery-plate C, an automatic self-adjusting passage or vertical shoot is employed, communicating between the hopper A and the delivery-plate C. This passage is composed of two stationary side-plates D, secured at their top ends to the hopper and framework of the carriage B^1; while a front plate D^1 is secured at its lower end to the angle-iron or steel main-frame E, in such a manner that it is raised and lowered along with the frame. A self-adjusting back-plate D^2 is pivoted or hinged at its lower end to the side-plates D of the shoot-box C^1, which is attached to the front end of the main frame. The back plate is also pivoted or hinged at its top end to two or more swinging arms or levers D^3, the lower ends of which are pivoted or hinged to the stationary framework of the carriage, in such a manner as to always provide a clear and close box or passage between the hopper and the delivery plate or shoot, no matter in what position they may be.









The hopper is provided with an internal dash-plate F, so as to relieve the pressure of the coal on the moveable door F^1, and so ensure a regular feed of coal being supplied to the revolving feed-wheel G. This has its operating cyinders H H^1 arranged in line with each other, with the rams connected together or formed in one, and with the rack H^2 between the two cylinders, in such a manner that the ram of the small or constant cylinder H forces back the ram of the large cylinder H^1 direct, without the intervention of any pawl. Also, in order to ensure more definite action being given to the rams of the cylinders for the feed-wheel G, there is substituted a trigger arrangement at the rear end of the main-frame E or beam E^1, in lieu of the spring-actuated lever arrangement hitherto employed. This trigger arrangement is composed of a lever J, mounted on the top of the spindle of the regulating valve or cock J^1, and formed with a forked portion, which, in its normal position, engages with a projecting pin or stud on the slipper-block L^2 of one of the horizontal rams.

The pusher K and pusher-rod K^1 are mounted below the H iron or steel beam E^1 of the main frame, which is composed of the H beam E^1 and top-plate E^2 stiffened by side angle-bars, in such a manner as to enable the horizontal cylinders L and rams L^1 to be mounted thereon. The slipper-blocks L^2 of these rams work in guides or slots formed in the top-plate E^2 in such a manner as to enable the rope or cord pulleys L^3 of the rams L^1 to work freely therein.

The shaft M which regulates the travel of the pusher K is also, in this case, mounted above the top-plate E^2 of the H beam E^1. It has its stops or projections secured to it; the stops acting against or upon a corresponding stop, screwed or otherwise retained in the slipper-block L^2 of one of the horizontal rams L^1. The thrust of the shaft M is taken up by an adjusting screw M^1, mounted in a bracket near the end of the top-plate E^2 and beam E^1, in such a manner that the end of the screw M^1 acts against the end of the shaft M.

The hydraulic raising and lowering cylinder N and ram N^1 are mounted horizontally—preferably on the top of the framework B of the carriage B^1. The ram N^1 of the cylinder N is furnished with a crosshead slipper-block N^2, which works in guides or channels formed in, or provided on, the framework B. The ram is fitted at its front end with two rope or cord pulleys P P^1—P being for a rope or cord P^2, one end of which is adjustably secured to the framework B, it being then passed around the pulley P, then back, over a guide-pulley P^3 mounted on the framework B, and down to a loop or saddle bracket P^4, which is attached to the main frame E. Near the front end of the main frame E, means are provided whereby two suspending cords or ropes P^5 may be attached, which (after passing up and over two guide-pulleys P^6) are connected to a yoke or cross-bar P^7, to the centre of which is connected a single rope P^8, which, after passing around the rear guide-pulley P^9, mounted on the framework B, runs around the other pulley P^1 on the ram N^1, and is adjustably attached to the cylinder N. The H iron or steel beam E^1 and connections are carried by the main angle-iron frame E through the medium of two central brackets Q and pivots.

The hand or power gearing R, for actuating the carriage B^1 from one set of retorts to another, is so arranged as to be capable of working with a double power as shown, as well as with a single power; and, if desired, the gearing R may be provided with a fly-wheel R^1 as shown.

Gas Motor Locomotives.—Holt, H. P.; a communication from A. Prawatke, of Dresden, Saxony. No. 23,196; Dec. 2, 1893.

When a gas-motor engine is employed to drive a car, ready means must be available of altering the speed of the car axles without correspondingly altering the speed of the engine. The gear for working the driving axles must also be so arranged as to allow for vertical oscillation of the car on its springs. This invention relates to gear suitable to be used for such purposes.

Loose on the engine-shaft (which always revolves in one direction), or on a countershaft driven therefrom, are two toothed wheels of different diameters, gearing with corresponding wheels on a parallel countershaft. Each of the wheels on the first-mentioned shaft is situated between two circularly grooved friction discs, which rotate with the shaft; and it has on its sides circular ridges corresponding to the grooves of such discs. The outer disc in each case is fixed on the shaft; but the other disc is free to slide along the shaft, although made to revolve with it. Between the two inner discs, there is fitted on the shaft (to revolve with it), a sliding sleeve, which can be moved by the driver to either hand. From this sleeve extend each way links connecting it to arms on bell-crank levers, pivoted on bosses fixed on the shaft adjacent to the two inner discs. When the sleeve is in the middle position, neither of the wheels is pressed between its inner and outer discs; and each wheel is thus left free. The shaft revolves without driving it; and consequently the engine in this condition does not drive the car. According as the sleeve is moved to one side or the other, the levers of the one or other set are turned, so as to clamp one or other wheel between the two grooved discs; and this wheel, being now driven by the engine, drives the car at the corresponding speed. When the other wheel, however, is clamped by sliding the sleeve to the other end, the engine drives the car at the other speed. In a convenient part of the driving gear, there is interposed a ratchet-wheel and pawl, allowing the car to outrun the engine—as, for instance, when it descends a gradient. The parallel countershaft, driven as above described, may be in the form of a sleeve having within it a shaft engaged to it through bevel reversing gear. This inner shaft has cranks linked by rods to cranks on the car wheels, so that the countershafts and gear are free to oscillate vertically on the car springs.

APPLICATIONS FOR LETTERS PATENT.

18,120.—RILEY, A. J., and WHITEHEAD, L., "Oil lighting." Sept. 24.
18,145.—FISCHER, F., "Incandescent gas-burners." Sept. 24.
18,237.—THRELFALL, G., and HODGES, R. J., "Gas-generating apparatus." Sept. 26.
18,286.—KENT, W. G., "Disc-engines, particularly suitable as water-meters." Sept. 26.
18,309.—BLUCHER, H., "Mantles for incandescent gas-lights. Sept 27.
18,331.—ROHLF, H. J., "Rotary water-meters." Sept. 27.
18,382.—WILSON, J. J., "Gas fires or stoves and the supply of gas thereto." Sept. 28.
18,392.—CAMPBELL, A., and SIM, W.C., "Distributing and controlling water supply in dwellings and other houses or structures." Sept. 28.
18,401.—COOPER, J. R., "Gas-pliers." Sept. 28.
18,417.—CUTLER, S., "Gasholder guide-carriages." Sept. 28.
18,440.—HERSEY, S., and KIRKHAM, HULETT, and CHANDLER, LIMITED, "Washing or scrubbing gas." Sept. 28.
18,441.—KIRKHAM, HULETT, and CHANDLER, LIMITED, "Condensing and washing gas." A communication from F. D. Marshall. Sept. 28.
18,445.—THWAITE, B. H., "Gas-generating plant." Sept. 29.
18,480.—JASKEY, W. N., and ELSE, E. S., "Automatic electrical gas-lighters." Sept. 29.
18,510.—KEMP, W., "Enriching gas." Sept. 29.
18,514.—ARONSON, J. N., "Oil and gas engines." Sept. 29.

Water-Works Extensions at Brighton.—The Brighton Town Council have accepted a tender of Messrs. James Watt and Co., of London and Birmingham, amounting to £8980 for the construction and maintenance of pumping-engine, boilers, deep-well pumps, and other machinery required at the Patcham pumping-station.

Boring for Coal at Balne, near Snaith.—A Syndicate is being formed, with a capital of £5000, for the purpose of testing the question whether or not coal is to be obtained at Balne, near Snaith. The Engineer who has the matter in hand (Mr. Child, of Wakefield) thinks there is no doubt that coal will be found at a considerable depth, and belonging to the Barnsley seam.

Stockport Corporation and Sulphate of Ammonia Manufacture.—It was stated at last Wednesday's meeting of the Stockport Town Council that the Gas Committee had considered the question of manufacturing sulphate of ammonia; and they had been recommended by a Sub-Committee to accept a tender of Messrs. Brotherton and Co., of Leeds, who would erect a place suitable for the plant at Portwood, and would purchase the liquor manufactured. At the end of five years, the Corporation could either take over the plant or renew the contract; and they would then receive £700 or £800 more for the liquor than they did at present.

The Gas-Workers' Union and the Huddersfield Corporation Gas Committee.—In July last the Local Secretaries of the Gas Workers' Union (Messrs. Paylor and Smith) forwarded a letter to the Gas Committee of the Huddersfield Corporation, in which they alleged that certain stokers had been victimized, but in what way has not been divulged. On Aug. 8, they addressed another letter to the Committee withdrawing the allegation, but implying that favouritism had been shown in the rotation of the stokers. The Committee are of opinion that a serious charge has been made against them by the Union in the management of their employees; and they have asked the Secretaries to explain the meaning of this latter letter, or withdraw altogether the statement contained in the former one.

Swansea Gas Company.—At the half-yearly general meeting of this Company, recently held at the works, the Chairman stated that the receipts for the past half year had been £24,744; and the expenditure £17,280—leaving a gross profit of £7465. The Directors proposed to carry £960 to the reserve fund, £1000 to the contingent fund, and the surplus balance to the credit of the profit and loss account. He was glad to tell the shareholders that the reserve fund had reached the amount allowed by Act of Parliament. The consumption of gas had increased 7 per cent., and the supply had been satisfactory, and in excess of the parliamentary standard. The Company had laid nearly 6000 yards of mains to meet the requirements of the Corporation in the outlying districts, and although these places did not take any private consumption of gas, the Company were anxious to meet the wishes of the Corporation and the public generally. After the usual dividend had been declared, and votes of thanks accorded to the Directors and the Engineer and Secretary (Mr. J. Thornton Andrews), the meeting terminated.

Electric Lighting and Gas-Meter Rent Questions at Darlington.—On the minutes of the Gas Committee being presented for confirmation at the meeting of the Darlington Town Council last Thursday, inquiries were made respecting the position of the borough with regard to electric lighting, and as to whether the Committee could see their way to abolishing gas-meter rents. Alderman Walker expressed his sympathy with those who were in favour of discarding the meter-rents. There were, he said, 47 per cent. of the householders in the town who were not using gas at all; and it might be possible to induce them to do so by taking that step. As to the electric light, he thought they could wait a bit longer. It had been introduced in 49 towns in the kingdom up to the present, and in 39 of those by private companies. Only nine or ten Corporations had taken it in hand; and in the main they were larger than Darlington. They would have to spend at least £30,000; and he thought they could count on their fingers the number of people who would want the electric light. Mr. T. M. Barron, the Chairman of the Committee, stated that they had received an assurance from the Board of Trade that they would not allow anybody else to come in on the understanding that the Corporation would give a reasonable assurance that, when the time came for the lighting of the town by electricity, they would be prepared to undertake it. With regard to meter-rents, it was competent for any consumer to buy his own; and as to Alderman Walker's remarks, he pointed out that a great many houses had not gas-fittings or service-pipes. The minutes were approved.

LEGAL INTELLIGENCE.

MARYLEBONE POLICE COURT.—Tuesday, Oct. 2.

(*Before Mr.* PLOWDEN.)

Unlawful Consumption of Gas.—A Stubborn Defendant.

To-day *John Wallis Tuck*, a grocer, of 75, Cambridge Road, Kilburn was summoned, at the instance of The Gaslight and Coke Company for unlawfully connecting a pipe with the Company's meter, thereby enabling him to burn their gas, without giving 24 hours' notice in writing of his intention to do so.

Mr. R. H. HUMPHREYS attended on behalf of the Company; defendant was unrepresented.

It appeared from the evidence that in June last the defendant owed the Company £1 15s. 11d. for gas consumed. On the 3rd ult., a final notice was served upon him, with an intimation that, if the money was not paid on the 6th, the gas would be cut off. This notice was allowed to run out; and on the 10th, a servant of the Company was sent to disconnect the meter. He asked the defendant to sign a permit for him to enter the premises to execute his mission; and the defendant wrote: "I make no objection to your entering; but I want gas to-night. Your account waits for your collection." The defendant had already been informed that the workmen could not receive the money; and, moreover, this was printed on the final notice. The pipe was then disconnected. At 5.30 that afternoon, after the local office was closed, a letter was received from the defendant stating that he required gas that night. The defendant was referred to the chief office at Westminster, and told that, if he paid the money there, the officials would wire to Kilburn, ordering the reinstatement of the supply. The defendant refused to do this, and wrote a letter to the Company to the effect that, as their collector had failed to apply legally for payment without insult (leaving a final notice), he now objected to transmit the amount to them; but he enclosed £2 on account of gas he wished to consume. He added: "You will see, by the label enclosed, that I am at a penalty, as I prefer to take this course rather than be a plaintiff in an action against you, because I am not quite certain of a verdict in my favour, but shall make sure of an advertisement for both of us in the daily journals." That same night the defendant's premises were lit with gas, which had been put on without the consent of the Company. On the 22nd, an officer took a reading of the meter, and found that 2000 cubic feet of gas had been burnt since the 10th.

Defendant denied having received a second notice. He admitted having caused the gas-meter to be reconnected with the pipe, and said he had been burning the gas ever since. He asked if it was not an insult to him to make him stand just outside the iron rails of a dock in that Court, with police officials by his side, as if he were a criminal. The Legislature, he was sure, never intended the Company to use the powers given them in such a way—in fact, he did not think a Police Court had jurisdiction, as it was a civil matter.

Mr. PLOWDEN observed that he failed to see on what ground the defendant had sought to contest the summons. The Company had acted legally in what they had done; and the defendant had equally clearly committed an offence for which he was liable to a penalty of 40s. He (Mr. Plowden) could well understand why the defendant had not commenced an action against the Company, because he was not sure of obtaining a verdict in his favour. But he did not mind coming to a Police Court, because he had confidence in the Press. There was no harm in that. Still, the vanity of getting cheap notoriety in the Press was sometimes expensive. He would have to pay a fine of 20s., with 23s. costs.

The defendant refused to pass through the door leading to the gaoler's room, where fines were received; and, after some altercation, he was forcibly removed. When in the gaoler's room, he refused to pay.

Mr. HUMPHREYS ultimately consulted with his Worship; and, in the end, the defendant was allowed a week in which to pay the money.

New Water-Works for Blyth.—The Local Authority of Blyth have purchased Hazleton Wood at Coalburn, and are there constructing a reservoir which, it is estimated, will hold 20 million gallons of water.

Fatalities at Gas-Works.—Last Tuesday an inquest was held at Pontypridd relative to the death of John J. Phillips, age 55, who succumbed on the previous Saturday to injuries sustained at the new gas-works for Pontypridd now in course of construction at Treforest. The evidence showed that the deceased was engaged as Clerk of the Works by the Local Board; and that, on the 18th ult., he was struck in the back by the beam of a steam-crane, and thrown into a clay puddle at the bottom of a tank. He was attended by Dr. Leckie, who said that he suffered from concussion of the spine, and that inflammation of the spinal marrow set in, extending to the brain, and causing death. A verdict of "Accidental death" was returned. While a labourer named Waller, was working at the Old Kent Road station of the South Metropolitan Gas Company last Tuesday, a skip containing coal fell on to his head, and fractured the skull. He died shortly afterwards.

The Inauguration of the Thirlmere Water-Works.—The Thirlmere Sub-Committee of the Manchester Corporation Water Committee have made their final arrangements for celebrating the completion of the Thirlmere works. The two closing days of this week will be devoted to this. On Friday morning, the members of the Council and a few guests will proceed to Thirlmere, where Sir John Harwood (the Chairman of the Water Committee) will turn on the water so that it may flow to Manchester. On the following day there is to be a demonstration of a popular kind in the city. The members of the Council and a number of leading citizens will assemble at the Town Hall. A fountain which is to be erected on the north side of Albert Square will at a given moment be set playing. In the course of the proceedings, an address will be presented to Sir John Harwood, in which his long and faithful services to the Municipality will be recognized; and congratulations will be offered to the people of Manchester and neighbourhood on the consummation of the enterprise to which the city set its hand some seventeen years ago.

MISCELLANEOUS NEWS.

THE PRICE OF GAS IN THE METROPOLIS.

Important Conference of Vestrymen.

At the Hammersmith Vestry Hall last Tuesday, there was a conference of delegates of Vestries and District Boards "appointed," so ran the notice, "to consider as to obtaining uniformity in the price of gas throughout the Metropolis." The invitation to the Vestries and District Boards to join in the conference emanated from the Hammersmith Vestry; and eighteen local authorities sent representatives—the majority coming from districts in The Gaslight and Coke Company's area of supply. Mr. T. CHAMBERLEN, the Chairman of the Finance Committee of the Hammersmith Vestry, was appointed to preside; and Mr. W. P. COCKBURN, the Clerk of that body, consented to fill the office of Hon. Secretary.

The CHAIRMAN, in opening the proceedings, said the questions they had been invited to consider should be thoroughly threshed out. He believed they were all agreed, or practically all agreed, that they were paying too much for the gas supplied to them. Whatever might be their opinions on the great question of the Unification of London, he believed they were all agreed that there should be a uniform charge for gas in London. The conference was the outcome of a public meeting held by the inhabitants of Hammersmith, at which resolutions were passed and sent to the Vestry, who took the matter into consideration. They knew that a conference had been held by the Vestry of St. Luke's; but still they thought it would be well to call the delegates together again to push the matter a step farther, as nothing but agitation would secure what they required. He supposed that what they really wanted was that the Gas Companies should be municipalized; but at present he thought that was rather far distant. The time, however, would come when both the gas and water supplies would be in the hands of the ratepayers; and the sooner that time arrived, the better it would be for all concerned. He believed all present were of opinion that the London Gas Companies had had control of the gas supply as long as they ought to have it, and that they would be doing themselves very little injury if, supposing they were allowed to go on for a time longer, they reduced the prices they charged. They had a monopoly of the gas supply, and the consumers were bound to go to them, so that they ought to put them upon the best possible terms. He hoped that some good would result from their deliberations that day. It was proposed to approach Parliament with the view of getting them to take up the matter, because he was afraid the Board of Trade would do very little.

Mr. J. M. LEVY (Hammersmith Vestry) moved the first resolution, as follows: "That this conference of delegates, representing eighteen parishes in the Administrative County of London, called to consider the excessive price charged for the supply of gas by the Gas Companies supplying the Metropolis, is of opinion that the time has arrived when the existing anomalies in the charges for gas supplied and use of meters by the several Companies supplying gas in the Metropolis should be removed, and that all gas supplied in the Metropolis to private consumers should be supplied at an uniform charge per 1000 feet, with the free use of meters." In the course of his remarks, Mr. Levy said he believed that, when Parliament fixed the standard price of gas and the limit of dividend to be paid by the Companies, they had no idea that the residual products and the quantity of gas consumed, and everything connected with the industry, would have attained to their present position. If they had had that idea, they would have made provision, as they had done of late years in many cases where a monopoly had been granted, for their rights and privileges to be given over at the end of 21 or 42 years as the case might be. In order to accomplish their objects, they must go to work now with a will. Although a conference was held by the Vestry of St. Luke's, something like twelve or eighteen months elapsed before they went to the Board of Trade, and then they had a very cool reception. He did not think it advisable to go to the Board of Trade again. The parish of Hammersmith had had to go before them respecting another matter; and they obtained a little satisfaction, but not much. They found a lot of red-tapeism; and it was a long time before they could get any reply to the appeal they made. He therefore thought they should go direct to the House of Commons upon this matter. He fancied the other parishes were not suffering so much as they were in Hammersmith with the Brentford Gas Company. That Company seemed to do pretty well as they liked. Although they supplied gas in Hammersmith, which was in the Metropolitan area, they were themselves outside the area; and they did not appear to be bound so much as the other Companies. The standard illuminating power of the London Companies was 16 candles; but the Brentford Company were only compelled to supply gas of 14-candle power, and, instead of having to pay less for the poorer quality, they had to pay more.

Mr. J. BRAYE (Kensington Vestry) seconded the motion. He hoped the delegates would make up their minds as to what they were going to ask for, because he was one of the deputation to the Board of Trade, and, on that occasion, they got a fairly good snub, as it seemed to him, some of their spokesmen advocated one thing and others another. The action of The Gaslight and Coke Company in putting 2d. on the price of gas supplied to the street lamps, meant that in Kensington they would this year have to pay £650 more on the present consumption. If they went to Parliament and asked for an inquiry, he hoped they would not mix up the question of the municipalization of the gas supply with the price of gas and readjustment of the Acts of Parliament. The time had arrived when the Legislature should overhaul the Gas Company's Acts. It was admitted by the Royal Commission who had been considering the question of the government of London that the Vestries were fairly good bodies; and he thought that, if they put forth their strength, they could handle this matter of price, and leave for a future day the question as to whether the Municipality of London should take over the supply. He also advised the members to encourage the electric light. They complained of what their forefathers had not done in regard to gas; but now they had the electric light before them, and yet some of them were not doing anything. The result would be that the electric light companies would, in course of time, get into the same position as the Gas Companies.

Mr. W. W. SAUNDERS (St. George's Vestry, Hanover Square) agreed generally with the resolution; but he thought it might be improved. It stated that the conference had been called to consider the "excessive" price charged for gas. Dealing with this from various points of view, he did not conceive that the price charged by certain of the Companies was excessive; and therefore he thought that word should be eliminated, and the words "varying prices" substituted. Neither did he agree that the charge for meters was a matter they need go into. It was a very nominal charge; and every consumer possessed the privilege of purchasing his own meter if he did not choose to hire one of the Gas Company. He would therefore move an amendment altering the words "excessive price" to "varying prices," and eliminating the references to the use of meters.

Mr. F. DETHRIDGE (Clerk to the Paddington Vestry), referring to the remarks of the last speaker, used the old argument as to the coal merchant not charging anything for weighing the coal he sold; and he stated that he had it from a gas engineer that the residual products obtained in the manufacture of gas were so valuable that they nearly covered the whole of the Companies' expenses. When the Companies obtained their Acts, they had no hope that the time would arrive when they would be able to get 4s. for 6d. They now realized such large profits that they could afford to be a little generous, and let the consumers have their meters free.

Mr. R. F. WHUR (Paddington Vestry), while deprecating anything in the way of confiscating any of the powers the Gas Companies held without giving them compensation, thought that it was the duty of the Local Authorities to see that those powers were properly administered, and that there was no sort of extravagance. In his opinion, extravagance and the bad administration of the Companies were the main causes of the excessive rates charged for gas; and he felt there should be a general inquiry into their working. The Hammersmith Vestry were labouring under great disadvantages. The Brentford Gas Company were admitted to be one of the most "sleepy and badly-administered" Companies that it was possible to find in the Metropolis. Were they, he asked, to pay an increased price for gas through their bad administration? He thought the time had come when the Vestries might go to Parliament, and ask for a general inquiry into the gas supply of the Metropolis, to see whether any steps could be taken not to deprive the shareholders of their fair dues, but to secure for the consumers their fair dues.

Mr. O. ALLDEN (Vestry of St. George the Martyr, Southwark), who seconded the amendment, said that the Vestry he represented did not think they were charged an excessive price for gas. They were supplied with 16-candle power gas, at 2s. 4d. or 2s. 5d. per 1000 cubic feet; so that it appeared that these prices were the lowest in London. It seemed to him that if one Company could give them a 16-candle light at a modest price, the other Companies could do the same, as he did not think that the cost of coal need be greater in one district than in another. As to the charges for meters, he considered that they were most reasonable. What he believed they wished to do was to bring down the price of gas to 2s. 5d., or as much less as they could. In his opinion, it could be reduced to 2s. and even 1s. 10d. per 1000 cubic feet.

Mr. A. MYERS (Islington Vestry) remarked that no charge was made for meters in the City; and he did not see why the same rule should not apply all over London.

Mr. LEVY intimated that he would accept the amendment.

Mr. W. JOHNSON (Hackney Vestry) pointed out that notices had been sent round by The Gaslight and Coke Company to the effect that the price of gas would be reduced to 2s. 10d. from the commencement of this quarter.

Mr. T. O. DREW (Fulham Vestry) thought that Mr. Levy had accepted the amendment with undue haste, and that, by dropping the word "excessive," they would be losing a great deal of the force of their argument. The very essence and point of their remonstrance was that they were not being treated by The Gaslight and Coke Company in one district the same as their consumers in another; and he did not see why this should be so. He did not think that, when the Company were placed under the sliding-scale, Parliament intended that the consumers in one part of the Company's area should pay an excessive price to make up the deficiency in the amount required for dividends that was caused by the lower price charged in the other portion.

Mr. T. GREENHILL (Hampstead Vestry) agreed that the word "excessive" was a right and proper one to use in the resolution. They were paying in the north of London 3s. for what could be obtained in another part of the same Company's area for 2s. 4d.; and yet he understood that in the north of London coal could be delivered at a less rate than in the south. Considering the great difference in price, he did not think a better word than "excessive" could be used; and he expressed the opinion that there was either mismanagement in the Company, or else they were "cheating the consumers."

After a little further discussion,

Mr. W. C. LEETE (Clerk to the Kensington Vestry) suggested the insertion, before the word excessive, of the words "varying and in many districts."

This modification met with general approval; and the resolution was accordingly altered and passed unanimously.

Mr. R. F. WHUR (Paddington Vestry) moved the second resolution, as follows: "This conference is also of opinion that it is desirable that a parliamentary inquiry should be instituted into the present management and workings of the various Gas Companies, their existing statutory rights, and the past results, financial and general, of the statutory sliding-scale of price and dividend." In support of the resolution, he said that nothing could be done unless there was a parliamentary inquiry into the existing conditions of the Companies, and to see how far they had complied with the Acts of Parliament. He had heard that thousands of pounds had been unnecessarily spent in the last few years by the Companies, rather than show the grand total of profits which they would have had from their residuals. He confessed that he might be wrongly informed; but, as far as he had

been able to observe, he did not think the Companies had done all they could have done in the interests of the consumers.

Mr. E. BURCH (St. George's Vestry, Hanover Square) seconded the motion, which was unanimously carried.

Major C. E. CRESWELL (St. James's Vestry), in accordance with notice, proposed—"This conference is of opinion that the standard of the gas supplied throughout the Metropolitan area should be of an uniform quality, and that the present limit, varying from 14 to 16 candle power, be raised, so as to ensure increased illuminating power; further that facilities should be granted for testing the gas at any station or place of supply." He stated that the standard illuminating power of the gas supplied by the three London Companies was 16 candles; by the Crystal Palace District Company, 14 or 15 candles; Lea Bridge, 14 candles; Wandsworth, 15 candles; Brentford, 14 candles; Mitcham, 14 candles; and Richmond, 15 candles. He characterized the gas sent out by the Companies as "foul, vile stuff," and declared that it was not worth 15d. per 1000 cubic feet. He quoted from the Metropolis Gas Act, 1860, the section referring to the illuminating power and purity of the gas, and afterwards remarked that it was "a very funny thing that the testing should be confined to 1000 yards from the works by that section." He considered that consumers should have the power (on payment of a small fee) to request an inspector to test the gas within their houses, without notice to the Company. This would be a protection to the consumer; and he believed it would be the means of keeping the gas in proper order.

Mr. LEVY seconded the motion.

Mr. SAUNDERS pointed out that the Local Authorities had facilities for testing gas at various stations provided for the purpose; and he suggested that the end of the resolution should read "and that further facilities should be granted," &c.

Mr. JOHNSON thought that the words "from 14 to 16" should be deleted; and the sentence altered to "that the present varying limit of candle power," &c.

Mr. ALLDEN considered that, if Major Cresswell was in earnest, he would raise the price of gas considerably, as, to carry out his idea of consumers having the power to call in at any time an inspector to examine the gas, a large staff of men would have to be maintained.

Mr. J. LAWRENCE (Islington Vestry) mentioned that, if a complaint was made by any parishioner as to the quality of the gas, the Vestry instructed their inspector to test the gas in the neighbourhood.

Mr. J. FLAMANK (Lambeth Vestry) observed that they had a complaint as to the quality of the gas a short time since. At the Vestry's request, the County Council sent an inspector to the Vestry Hall on a Sunday to test the gas; and he found it was below the standard illuminating power. It was intended to continue these Sunday tests.

Mr. W. DAVIES (Battersea Vestry) did not think any reason whatever had been adduced by the mover and seconder in support of the resolution. They had no difficulty in testing the gas in any portion of the district, if they felt so disposed, as the County Council had always met them in a friendly spirit. It would weaken the conference immensely if they passed this resolution after the two practical ones they had already agreed to.

A DELEGATE observed that it was true the gas could be tested at any point; but, if a deficiency was found, penalties for the default could not be recovered.

It was then agreed to alter the resolution after the word "quality" as follows: "And that the present varying limit of candle power be raised, so as to ensure increased illuminating power, and that further facilities should be granted for testing the gas at any station or place of supply." In this form it was carried.

The following petition to the House of Commons was then adopted:—

IN PARLIAMENT.

To the Honourable the Commons of the United Kingdom of Great Britain and Ireland in Parliament assembled.

THE HUMBLE PETITION OF A CONFERENCE OF DELEGATES OF VESTRIES AND DISTRICT BOARDS IN THE ADMINISTRATIVE COUNTY OF LONDON,

Sheweth.

That your petitioners are a conference of delegates, duly elected by various Vestries and District Boards within the area of the Administrative County of London.

That the rateable value of the districts represented by your petitioners is £17,685,552; the population thereof being 2,426,475 persons.

That the parishes comprised within the Metropolitan area are supplied with gas by the following Gas Companies: The Gaslight and Coke Company, Commercial Gas Company, South Metropolitan Gas Company, Brentford Gas Company, Wandsworth Gas Company, Crystal Palace Gas Company.

That large sums of money are yearly paid by the authorities represented by your petitioners as the lighting authorities to the said Gas Companies for gas supplied to the public lamps, and also further sums for gas supplied in their capacity as private consumers at their offices, &c.

That by the several Acts of Parliament incorporating the said Companies, provision is made for regulating the price of gas supplied and the dividends to be paid upon the capital stock of such Companies, according to a scale under which the standard dividends paid may be increased in proportion to the reduction of charge for gas below the standard price fixed by such Acts.

That the price charged by the said Gas Companies for gas supplied to the public lamps and private consumers is as follows:—

	Public Lamps. Per 1000 Cubic Feet.	Private Consumers. Per 1000 Cubic Feet.
	s. d.	s. d.
Gaslight and Coke Company (South of Thames)	2 4	2 5
" " " (North of Thames)	—	2 0
" " " "	—	3 0
Commercial Gas Company	—	2 9
South Metropolitan Gas Company	2 4	2 5*
" " "	—	2 6
Brentford Gas Company	2 9	3 1
Wandsworth Gas Company	—	2 8
Crystal Palace Gas Company	—	2 9†

That your petitioners are of opinion that the time has arrived when the existing anomalies in the charges for gas supplied and for use of meters by the said Gas Companies should be removed, and that all gas supplied by the said Companies to private consumers should be supplied at an uniform charge, with the free use of meters, such charge not exceeding the lowest rate charged by any of the Companies supplying gas to the Metropolis.

That your petitioners believe that the object of Parliament in fixing the standard price and statutory limit of dividend authorized to be paid by the several Gas Companies was to encourage the development in the public interest of the gas industry, and at the same time to provide a fair remuneration to those persons who had embarked their capital in the said undertakings, but were not at the time or had not previously been in receipt of a reasonable return upon their outlay. But your petitioners believe it was not the intention of Parliament to fix the rate of charge for gas supplied and the limit of dividends for all time, but that the standard price and rate of dividend so authorized were intended to be of a temporary character only.

Your petitioners are of opinion that a sufficient time has now elapsed, during which the statutory dividend authorized has been paid by the several Metropolitan Gas Companies, as amply to compensate those interested in the gas undertakings for the loss of income sustained during the time the capital expended was unremunerative, and that, in justice to the consumers of gas within the said Administrative County, the provisions of the Acts fixing the price of the gas supplied, and the rate of dividend, should be reconsidered.

Your petitioners are aware that public meetings of ratepayers have recently been held in the Parish of Clerkenwell, at the Holborn Town Hall, at Hammersmith, and other places, at which resolutions were passed on the subject of a reduction of the price of gas.

Your petitioners have passed resolutions to the following effect:—

(1) That this conference of delegates, representing eighteen parishes in the Administrative County of London, called to consider the varying and in many districts excessive price charged for the supply of gas by the Gas Companies supplying the Metropolis, is of opinion that the time has arrived when the existing anomalies in the charges for gas supplied and use of meters by the several Companies supplying gas in the Metropolis should be removed, and that all gas supplied in the Metropolis to private consumers should be supplied at an uniform charge per 1000 feet, with the free use of meters.

(2) This conference is also of opinion that it is desirable that a parliamentary inquiry should be instituted into the present management and workings of the various Gas Companies, their existing statutory rights, and the past results, financial and general, of the statutory sliding-scale of price and dividend.

(3) This conference is also of opinion that the standard of the gas supplied throughout the Metropolitan area should be of an uniform quality, and that the present varying limit of candle power be raised so as to ensure increased illuminating power, and that further facilities should be granted for testing the gas at any station or place of supply.

Your petitioners therefore humbly pray that your honourable House will be pleased to direct an inquiry into the present management and working of the various Gas Companies supplying the Metropolis, and as to their existing statutory rights and the past results, financial and general, of the statutory sliding-scale of price and dividend; such inquiry to include the question as to obtaining an uniform standard in the quality and illuminating power of the gas, with increased facilities for testing same at any station or place of supply, with the object of a Bill being subsequently introduced into your honourable House to provide for reducing the standard price and statutory limit of dividend now authorized to be charged and paid by the said Companies, and for an uniform charge throughout the Metropolis for all gas supplied, to include the free use of meters.

And your petitioners will ever pray, &c.

Two further resolutions were passed—the first, instructing the Hon. Secretary to arrange a conference with the Members of Parliament representing Metropolitan constituencies, to be held on the reassembling of Parliament in November, with the view of obtaining their support to the petition; the second, agreeing that a copy of the minutes of the conference be forwarded to the Board of Trade, the London County Council, and all the Vestries and District Boards in the Metropolis.

* In the course of the discussion, the Hon. Secretary stated that since the petition was prepared he had learned that the price charged for gas supplied to public lamps in the South Metropolitan Company's district was now 2s. 3d. instead of 2s. 4d., with 5 per cent. discount if paid within one month; and to private consumers it was 2s. 4d., and not 2s. 5d. † Regarding the Crystal Palace Gas Company, he stated that the charge for gas supplied to the public lamps was 2s. 6d., less 10 per cent. for cash; and the price to private consumers had been reduced to 2s. 8d.

COMMERCIAL GAS COMPANY.

The Half-Yearly General Meeting of this Company was held last Thursday, at the Cannon Street Hotel, E.C.—Mr. J. BLACKETT GILL in the chair.

The SECRETARY (Mr. H. D. Ellis) having read the notice convening the meeting, and the minutes of the previous meeting, the report and accounts—given in the JOURNAL for the 25th ult.—were presented.

The CHAIRMAN said he thought the shareholders might congratulate themselves upon the accounts submitted on this occasion, because, although in one particular, perhaps, they might wish them to be rather better, yet, on the whole, he thought they would agree with him that the figures were satisfactory. Without wearying them by going through all the items, he would, as was his custom, allude to a few of the most interesting points in the conduct of the business during the past six months. First and foremost, of course, they had to deal with coals; and it would be seen that they had cost £62,087. This was £7471 less than in the corresponding period of 1893. Coke realized £31,000, which was £6589 more; tar, about £20 more; and sulphate of ammonia, £12,559, or £3091 more. Therefore, as their coals cost less by £7471 and the residuals yielded more by £10,358, the coals showed a net gain of £17,829. This must, he thought be regarded as a satisfactory statement. On the other side of the account, the gas-rental was less by £8279. This was mainly accounted for by the reduction in price from 2s. 9d. to 2s. 7d. per 1000 cubic feet; but at the same time he was bound to own to a somewhat smaller consumption, which always caused them anxiety and regret, more especially as they knew that on the other side of the water the South Metropolitan Gas Company showed a considerable increase. He supposed their falling-off must be put down to the poorness of their district and the badness of the times. It had cost them £129,000 to earn £183,000; leaving a balance of £54,000 to be carried to the profit and loss account. Out of this sum the Directors proposed the declaration of a dividend at the rate of 13 per cent. per annum on the old stock, and at the rate of 10 per cent. per annum on the new stock. This was not their statutory dividend by one-half per cent. It had not been their custom of late years to pay the full statutory dividend

for many reasons; but he thought the proprietors would agree with him that 13 per cent. was an agreeable dividend to receive. The remaining half per cent. was placed to the reserve of undivided profits, which, as they knew, was some time ago a good friend to them, because they would not have had their dividends but for the accumulations of previous years. It was possible that on some future occasion they might again be glad to fall back upon such a reserve. He was pleased to say that the works had been well maintained during the past half year. Possibly the most interesting feature connected with the accounts was the very great increase in their automatic prepayment or "coin" meters. They had nearly doubled the number since they met this time last year; there being now 1100 meters of the kind in their district. Of course, they had long arteries through which their mains ran; and in them they had a certain number of consumers. But running out of the main thoroughfares were numberless narrow streets; and it was in these that they now hoped to obtain consumers by the introduction of the "coin" meter system. He believed this system would prove not only advantageous to the Company, but—what they all desired—a real boon to working people. They found that a prepayment meter passed, on the average, about 12,000 cubic feet of gas in the course of a year. When they came to consider that working men could have a good light, and something to boil their water with, by putting almost the smallest coin of the realm into a slot, it must be apparent to this class of the population that the gas companies were good friends to them, whatever some of the outside public might try to make them believe. The Company had 4400 stoves in their district, which showed a certain increase. The only remark he had to make on this point was that it seemed to him sometimes rather a waste that they should have to provide gas of such high illuminating quality for the humble purpose of cooking a mutton chop; but, of course, they were tied by Act of Parliament. On the Continent, the gas was of less illuminating quality than the gas companies in this country supplied; and no mortal being would know the difference. The cost of producing gas of the quality now required was so considerable that no doubt it would be a great boon to all concerned if they were permitted to supply it of a lower standard than 16 or 17 candles. The Tower Bridge, which was a marvel of engineering skill, and of which the City was justly proud, was lighted half by this Company, and half by the Company on the other side of the water. The authorities fortunately gave up the idea of illuminating the bridge by electricity, which, he thought was wise, considering how some of the streets were lighted by it at night. The Company supplied, for the purpose of lighting their half of the Tower Bridge, 1⅛ million cubic feet of gas during the six months under review. Possibly many of the proprietors had read an account of a deputation which waited upon Mr. Bryce some time age—a deputation of gas consumers, although he was glad to say there were none from their district among them—to desire him to open an inquiry into the parliamentary powers of the Gas Companies for supplying London with gas. His object in calling attention to it was because he thought the remarks of a Radical gentleman of, he supposed, a Radical Government were peculiarly reassuring to proprietors of gas companies generally. Mr. Bryce said: "He was bound to have regard to the good faith which they must keep with investors, and to the danger of disturbing a settlement by Parliament on the faith of which investments had been made." When they came to consider that in their Company the great bulk of the proprietors were those who had invested their savings on the faith of an Act of Parliament, it appeared to be a monstrous thing that, for an instant, the sanctity of contract should be impaired. In another portion of his interesting speech, Mr. Bryce alluded to a bad bargain being made at the time the sliding-scale was adopted. The Chairman of The Gaslight and Coke Company, in answer to this remark, said that the total of the Metropolitan Gas Companies' increase of profits since the sliding-scale was introduced amounted, in round numbers, to £16,978,000, of which the consumers' share was about 84½ per cent., or £14,369,000, while the shareholders received 15½ per cent., or £2,600,000. For the life of him, he (the Chairman) could not see that this was a bad bargain. When they came to reflect that in 1829 their Ratcliff district supplied gas at 12s. 6d., in 1875 at 3s. 9d., and to-day at 2s. 7d. per 1000 cubic feet, he thought they would agree with him that it must have been a good bargain for all concerned. He had now to allude, with great regret, to certain matters contained in the report. No doubt many of the proprietors missed from his side of the table the well-known features of their old friend Mr. Robert Jones. Forty years ago he came to the Company when the Commercial gas shares were hardly worth the trouble of buying; and he left the Board the other day with the Company in a satisfactory position in every respect. No man could have served a company with greater fidelity and trustworthiness or ability than their old friend; and it was a great grief to the Directors to part with Mr. Jones, who was a link with the past. He (the Chairman) was sure the shareholders felt the same as the Board did in the matter. In 1875, when the sliding-scale was introduced, Mr. Jones was their trusted adviser; and he, in company with Mr. Richard Bradshaw, accepted the principle. It was somewhat of a "leap in the dark;" and many of the shareholders would rather have kept to the 10 per cent. than run the risk of getting more or less as the case might be. But the good judgment of their friends prevailed upon them to adopt it; and it had turned out fortunately for them all. To fill the vacancy caused by Mr. Jones's resignation, they had elected Mr. Walter Hunter, who had lived in the Company's district all his life; and they felt that, in putting his name before the shareholders, they could not submit one more likely to gain their confidence. No man could be better acquainted with the wants of their district than was Mr. Hunter; and he was sure this gentleman would be a valuable addition to the Board. One other matter was the departure from their midst of their friend Mr. Henry Laurence Hammack. Mr. Hammack's father was Chairman of the Ratcliff Company; and he himself had served their Company for 26 years. He was always attentive to his duties, and his colleagues missed in him a kind and genial friend; and his absence for ever the Directors deeply regretted. Mr. Hammack died abroad, quite recently; and, owing to some members of the Board having been away on their vacation, and to other causes, the question of appointing a successor had not been discussed. He felt sure, however, that whoever was put forward by the Board would obtain the confidence of the shareholders as warmly as, he had the boldness to imagine, the present Board did. There was only one more subject to which he wished to allude; but it was an agreeable one—viz., that the Directors were determined to reduce the price of gas at Christmas next. It was a real trouble to them to increase their charge; and they were only too pleased to be able to lower it to 2s. 6d. per 1000 cubic feet. He had no doubt whatever as to the wisdom of the step. They might not, perhaps, find their next accounts quite so satisfactory as the present ones, as they had had to pay somewhat more for their coal. He did not think, considering the state of trade, they ought to have paid quite as much as they had done; but all the Metropolitan Gas Companies were in the same boat. He hoped the reduction proposed to be made in the price of gas would lead to a larger consumption. Taking all things into consideration, there appeared to be no reason to doubt that the accounts for the current six months would be of a satisfactory character. He then moved—"That the report and accounts be received and adopted, and entered on the minutes."

The DEPUTY-CHAIRMAN (Mr. W. G. Bradshaw) seconded the resolution; and it was carried unanimously, without discussion.

The CHAIRMAN next moved—"That, pursuant to the recommendation of the Board of Directors, dividends be declared for the half year ending June 30, 1894, at the rates of 13 per cent. per annum on the old stock, and 10 per cent. per annum on the new stock, in both cases less income-tax."

The DEPUTY-CHAIRMAN seconded the motion; and it was passed.

Mr. G. LIVESEY said he wished to make a few remarks with reference to their old friend, Mr. Robert Jones, as probably he (Mr. Livesey) was the oldest friend of Mr. Jones in that room. He was an officer in a London Gas Company when that gentleman came to take charge of the Commercial Company; and he had seen what he had done for it, and how much he had been appreciated by those who knew him. He felt it would be nice for the proprietors to send to Mr. Jones a message of sympathy and appreciation of the services he had rendered to the Company. He therefore proposed—"That this meeting is desirous of expressing its sympathy with the late Deputy-Chairman, Mr. Robert Jones, in his illness, and also of showing its hearty appreciation of his long and honourable connection with the Company which owes so much of its prosperity during the last forty years to his great ability and devotion to its interests."

Mr. CECIL seconded the motion.

Mr. T. BEVAN (a Director) expressed his pleasure that Mr. Livesey had brought forward such a proposition. As probably the largest shareholder in the room, he felt a particular interest in this little mark of attention which they had it in their power to convey to their friend, whom they all appreciated so highly.

The CHAIRMAN said he cordially concurred in all that had been said in praise of Mr. Jones. He would only remark that the Board had had engrossed upon vellum their feelings of regard and affection for Mr. Jones; and it had been sent to him. He should not like the proprietors to think that the Board had failed to communicate to Mr. Jones their sympathy and regard.

The motion having been agreed to unanimously,

The CHAIRMAN promised to acquaint Mr. Jones of it without delay.

Mr. LIVESEY then moved a vote of thanks to the Chairman and his colleagues on the Board.

Mr. R. HESKETH JONES, J.P., seconded the motion.

Mr. HUBBARD said he had been requested by several stockholders to mention the name of a gentleman with a view to his having a seat on the Board. He referred to Mr. Norris, of Harrow, who was supported by Sir Henry Peek, Sir F. Bramwell, Mr. Barry, M.P., and numerous other stockholders.

The vote of thanks having been unanimously accorded,

The CHAIRMAN briefly acknowledged the compliment. Referring to Mr. Hubbard's remarks, he said the Directors had before them several names of gentlemen of standing, and fully qualified to fill the vacancy on the Board. They had no personal predilections; their only object being to secure a man who was fit for the post, and who would obtain the confidence of the proprietors.

A hearty vote of thanks was then passed to the officials,

The ENGINEER (Mr. H. E. Jones), in thanking the meeting on behalf of himself and the staff he represented, said he wished to answer the challenge that had been thrown down by a gentleman of some weight in gas matters as to their policy of supplying working men with gas on the "coin" meter system. The gentleman in question had stated that the London Gas Companies had made a great mistake in rushing into the supply. He had only to tell them that it was his deepest possible shame that, instead of "rushing" at it, they had been rushed at. They started with a certain staff and a 1000 applications. They doubled their staff, and still they had 1000 applications. They trebled their staff, and there were 1000 applications still. There was the greatest possible demand by workpeople in the East-end of London for gas on these terms; and he thought it was a grand thing for the Company to be able, by such a system, to obtain consumers in the miles of narrow streets in their district to which the Chairman had alluded.

Mr. ELLIS also thanked the proprietors for their vote on behalf of himself and the secretarial staff.

The proceedings then terminated.

The Transfer of the Neath Water-Works to the Corporation.—The Neath Corporation took formal possession of the water-works last Saturday week. At noon some of the members, headed by the Mayor (Dr. Davies), presented themselves at the door of the office of the Water Company, where they were met by the Secretary (Mr. E. C. Pole), who, with a few appropriate remarks, handed the Mayor a silver key, bearing a suitable inscription. On His Worship opening the door, he expressed the satisfaction which he felt at this happy termination of the negotiations. The sum paid by the Corporation was £30,070, in addition to which the debentures of the Company, amounting to £8964, will be taken over; leaving a balance of £7000 to be paid by the Neath Rural Sanitary Authority for the Skewen portion of the undertaking. The total purchase-money was £46,034.

SALFORD CORPORATION FINANCES.

A Serious Deficiency.

The Salford Corporation are face to face with a serious difficulty regarding their finances; certain deficiencies, amounting in the aggregate to about £70,000, having arisen in connection with the Corporation funds. A Special Committee has been appointed "to investigate the condition of the finances, to ascertain how the situation has been brought about and who is responsible therefor, and to report what measures are necessary to keep the expenditure of the Corporation within legitimate bounds for the future." Various questions regarding the matter were asked at last Wednesday's meeting of the Council; and Alderman Husband, the Chairman of the Finance Committee, assured the Council that, whoever might be found blameworthy, no discredit would attach to the Finance Committee as the result of the inquiry that was at present in progress. Meanwhile, it is proposed to make good the deficiency by asking the Local Government Board for power to borrow the sum of £34,071, by getting an extra £10,000 from the Gas Committee out of the current year's profits, by transferring £4000 from the water depreciation fund account, and by transferring £12,000 received by the Technical Instruction Committee under the Local Taxation (Customs and Excise) Act, 1892. It was recently decided by the General Purposes Committee, to raise the money in this way rather than by levying a supplementary rate, as would otherwise have been necessary. At Wednesday's meeting, the various Committees concerned agreed to the proposals; Mr. Holland stating, on behalf of the Gas Committee, that he thought it would be found at the close of the year that they could well afford to pay the extra £10,000 out of the profits. Mr. Mandley, however, warmly protested against this "juggling" system of finance—a system worthy of any rotten limited company—the result of which would be to lay up a burden of taxation for the ratepayers of the future. The proposals were, however, adopted.

COLONIAL GAS UNDERTAKINGS.

In the JOURNAL for the 25th ult, we noticed the proceedings at the recent meeting of the Launceston (Tasmania) Gas Company. The reports of other colonial gas companies have lately come to hand; and we take therefrom the following particulars:—

The net profit realized by the Australian Gaslight Company in the six months ending June 30 last amounted to £54,116; and out of this the Directors recommended the payment of a dividend of 9s. per share on the old shares, and in proportion on all the new shares on which the final instalment had been paid at the above-named date. This would absorb £51,132, and leave a balance of £2984. The revenue from the sale of gas, &c., amounted to £156,344; and the balance brought forward made a total of £162,799. The expenditure incurred in the manufacture and distribution of gas came to £90,749; the total outlay being £108,683. The works and plant of the Company are reported by the Engineer (Mr. T. J. Bush) to be in excellent condition. The satisfactory results obtained at Mortlake by the use of West's stoking machinery have led the Directors to give instructions for the adoption of a similar method of working at Sydney. The order for the necessary plant has been placed with West's Gas Improvement Company, Limited; and it is expected that the first portion will be at work by next winter. A reduction of 1s. per 1000 cubic feet has been made in the price of gas in certain parts of the Company's district, in the hope that increased consumption will result therefrom. More convenient and centrally situated offices have been taken at Parramatta; and samples of the newest gas appliances are kept on view. These offices have already been found of great advantage, both to the consumers and the Company.

The Directors of the Brisbane Gas Company, in the report they presented at the last half-yearly general meeting, stated that the sales of gas in the six months ending June 30, 1894, amounting to £17,087, were less than in the corresponding period of 1893; but at the same time the cost of production had been proportionately reduced. The disposable balance of £7479 was employed in the payment of a dividend of 4½ per cent.—absorbing £6610; and leaving a balance of £869 to be carried forward.

The Maitland Gaslight Company, Limited, made a profit of £906 in the half year ending April 30 last; and the balance carried forward (£202) totalled up to £1108. The Directors appropriated this sum as follows: Payment of a dividend at the rate of 8 per cent. per annum, £620; written off works, £200; carried to the reserve fund, £200—leaving £88 in hand. Notwithstanding the general depression in all businesses, the operations of the Company in the above-named period were successful. The Directors have improved the works by erecting a new retort-house; and they report the whole of the plant to be in first-class order. The only outlay in this connection expected for some time will be for extension of mains.

The Maryborough (Queensland) Gas and Coke Company, Limited, had a larger day consumption of gas in the six months ending June 30 last than in any previous half year, owing to the increased use of gas engines, cookers, and stoves. The profit, with the balance brought forward, amounted to £937, which was subject to a deduction of £38 for dividend tax; leaving £899 available for distribution. The Directors recommended a dividend at the rate of 6 per cent. per annum, amounting to £750, which would leave £149 to the good.

THE ELECTRIC LIGHTING AT LONDONDERRY.

The Repeated Bursts in the Cables.—The Corporation in a Dilemma.

The Lighting Committee of the Londonderry Corporation had under consideration at their meeting on Monday last week, a report by their Resident Engineer (Mr. J. Christie) with reference to the defects in the electrical cables. He stated that since Sept. 6 there had been twelve more bursts; and some of these had left 44 lamps in darkness on particular nights, and others a smaller number of lamps. In two or three instances, the breaks had occurred during testing; but in the majority of cases, they had happened in ordinary running. During the discussion, Mr. Thompson said, in connection with the testing, the members would be astonished at the revelation he was about to make. Their Engineer (Mr. Blake) drew up a specification, which was submitted to Dr. John Hopkinson for his consideration. On Dr. Hopkinson approving of the specification, tenders were invited; and Messrs. Siemens Brothers' tender for the cables was accepted. A few days ago, he made an inquiry regarding the tests that were to be applied to the cables according to the specification; and he was told that they had all been given. He obtained the original specification, as sealed by Messrs. Siemens; and he was surprised to find that the clause relating to the efficient test—the clause that was in the document submitted to Dr. Hopkinson, and approved by him—had been struck out; and they had accepted the tender *minus* the clause relating to testing. In the document with which Messrs. Siemens accompanied the specification, they said the tests, as mentioned, were impracticable. Their words were: "The above plant would be in entire accordance with your printed specification, except that we could not guarantee each circuit, when laid and connected, to have an insulation resistance of 5000 megohms, as mentioned in the last paragraph of your specification, as, the circuits being about 7 miles in length, this would mean an initial insulation resistance of about 35,000 megohms per mile, which we consider impracticable. As stated above, however, the insulation resistance of the cable itself would be 5000 megohms, as required by your specification." This letter, so far as he knew, had never been brought before the Corporation—they had never had a meeting to consider it. (Several members: "Never.") He was very sorry to have to expose this matter; but he was sent there by the public, and, as promised when he sought their suffrages, he would do his duty without fear or favour. Alderman Bell remarked that Mr. Thompson had made quite a revelation. The Mayor suggested that the Committee should adjourn, and request the attendance of Mr. Blake. It was stated by Mr. Turner that, when he moved that the plant should be taken over from Messrs. Siemens, he did so on the certificate that the work had been done to Mr. Blake's entire satisfaction. He knew nothing of any modification of the specification. A long discussion ensued as to what was best to be done under the circumstances; and eventually a motion was carried that, considering the gravity of the matter referred to, the meeting adjourn, and that Mr. Blake be requested to attend the adjourned meeting. Mr. Christie, in his report, added that one of Messrs. Siemens' head electricians, who had been sent over to look into the cause of the repeated flaws in the cables, was in the station when one of the breaks took place. He had now returned to London to report to Messrs. Siemens.

Oswestry New Water-Works.—The Oswestry Corporation last week resolved to apply to the Local Government Board for a further loan of £2500 for the purpose of expending it upon their new Penygwely reservoir.

The Stockton Corporation Gas Coal Contracts.—The Stockton Corporation have accepted tenders for the ensuing year for 29,000 tons of screened gas coal at 9s. 1½d. per ton, and 1000 tons of unscreened at 8s. 9d. per ton.

Additional Storeage Plant for Bingham.—Messrs. R. Dempster and Sons, Limited, have been entrusted with the contract for the gasholder and wrought-iron tank for the Bingham Gas-Works, tenders for which were recently invited in the JOURNAL.

The Extension of the Water-Gas Plant at the Belfast Corporation Gas-Works.—The Gas Committee reported at the meeting of the Belfast Corporation yesterday week that they had accepted the offer of Messrs. Humphreys and Glasgow to supply and fix the carburetted water gas and steam-boiler plant required for the extension of the system approved of by the Council on Sept. 1 last; the amount of the contract being £18,500. A report on this subject by the Engineer (Mr. Stelfox) was published in the JOURNAL for the 4th ult.

The Electric Lighting Question at Folkestone.—The scheme for lighting Folkestone by electricity at a cost of about £12,000 proposed by Mr. D. Baker, was discussed at great length by the Town Council last Wednesday week. Mr. Baker said he considered that the amount suggested by the late Electric Lighting Committee (£35,000) was altogether beyond what was justifiable. He had sketched out a scheme, and submitted it to Mr. Medhurst, a gentleman who was well known in the electrical world, and who would undertake that the project should be carried out for the amount named. The scheme would be extensive enough for Folkestone until the town grew to 100,000 inhabitants. He moved the appointment of a Committee of nine members, excluding the members of the former Committee, to report upon the matter, with power to instruct Mr. Medhurst to prepare the necessary plans, estimates, and details, and make a canvass of the probable consumers; also to pay that gentleman a fee not exceeding 50 guineas. The motion was agreed to.

West Gloucestershire Water Company.—According to the report presented by the Directors at the meeting of this Company last Saturday week, 320 additional services were laid on during the six months ending Sept. 1 last; making the number of houses and other properties supplied by the Company on that date 5199, and which, together with some meter and miscellaneous supplies, were estimated to produce a water-rental of £4078 per annum. To this must be added about £50 per annum for rent of property belonging to the Company; thus making a total estimated income on that date of £4128. This was an increase of £314. Extensions of mains had been made, which carried the water past 600 or 700 additional houses, and were already proving remunerative. The whole of the loans to June 30 had been paid off; and consequently the amount previously paid for interest would go to the credit of the next half-year's revenue account. After paying all working expenses, interest on debenture stock, and special loans, there was a net profit of £479, which, together with the £250 brought forward, made a total of £729. From this the Directors recommended the declaration of a dividend, less income-tax, at the rate of 1¾ per cent. per annum (as compared with 1¾ per cent. per annum the previous half year). The report was adopted.

EAST LONDON WATER-WORKS COMPANY.

The Half-Yearly General Assembly of Proprietors was held at the Company's Office, St. Helen's Place, Bishopsgate, last Thursday, under the presidency of Mr. GEORGE BANBURY.

The SECRETARY (Mr. I. A. Crookenden) read the notice calling the meeting; and the report of the Directors, an abstract of which appeared last week, was taken as read.

The CHAIRMAN observed that the increase of revenue, amounting to £2899, was fairly satisfactory, and arose from the normal growth of the district; so that there was nothing deserving of special note, financially, regarding the working of the past half year. They showed a decrease of £948 in the working expenses; but this was spread more or less proportionately over the various items of charges, so that there was no one item which stood prominently forth calling for any particular observation. It was interesting to note that the income derivable from the 1957 houses newly supplied during the past six months averaged £1 4s. 1d. per dwelling, as against £1 2s. 2d. for the 1878 houses laid on during the corresponding period of last year. This clearly indicated that there was a slight improvement in the class of tenements now being erected in their district. The accounts showed that, out of the half-year's water-rates due to the Company, amounting to £153,359, they only lost £362 by bad debts. This was eminently satisfactory, and reflected the greatest credit upon the Secretary and staff. A good deal had been done towards completing the works in hand. The new pumps for the Chingford well had been fixed; and the quadruple expansion engine for working them was ready for delivery. The water from this well would in future be pumped to a high-level reservoir, to be constructed at Buckhurst Hill, whence it would gravitate to Chigwell, Snaresbrook, Wanstead, and other increasing neighbourhoods. This would in reality be a counterpart of their Waltham and High Beech system, which had answered so admirably, and which was the *beau idéal* method of water supply, as it maintained uniform pressure, saved any strains upon the mains, and caused the engines to run steadily and smoothly, as they pumped into an open end. The beautiful triple-expansion engine, by Harvey, of Hayle, had been erected at Walthamstow, and could be set to work almost immediately; while before very long the adjoining new filter-beds would be at work, benefiting the large Essex district. The new engine just put up at the Lea Bridge station would not only greatly improve the Company's method of delivering therefrom, but would enable them to retain the Victoria Cornish engine, as an additional reserve in case of accidents. Their new capital would now permit them to push on the construction of the long-desired additions to the Walthamstow storeage, which were recommended by General Scott and strongly advocated by the Royal Commission, and for which they obtained an extensive site some years ago. They would be glad to hear that both the Government Analyst and the Chemical Examiners acting on behalf of the Companies gave very favourable reports as to the quality of the Company's supply. In the report made last month made by Dr. Frankland, the Government official, their river and deep-well supplies ranked next to the New River for purity—thus obtaining the second place amongst the Metropolitan Water Companies. Dr. Frankland further stated: "The water taken from the Lea by the East London Company was efficiently filtered before delivery, and was made to rank with the deep-well waters in respect of organic purity." In the annual report of the Local Government Board, just published, there was a very remarkable instance of the value of filtration given by Professor Koch, the great German specialist. Hamburg and Altona both went to the Elbe for their water supply; the intake of Altona being more polluted than that of its neighbour. During the recent outbreak of cholera, Hamburg suffered severely, whilst Altona was free from epidemic; as the latter filtered the Elbe water, and the former did not. A still more striking illustration was that in a court in Hamburg supplied with Altona filtered water, the residents were free from cholera, although the disease was raging all round them. In last month's report of the Registrar-General, the low death-rate showed that the health of London had lately been exceptionally good—better, in fact, than that of the other great cities of the United Kingdom or of those of the Continent. In this respect West Ham, which was wholly supplied with East London water, stood, as usual, in the highest rank. The last time he addressed the shareholders was a memorable day for the Company, as, almost immediately after their meeting, their Bill came on in the House of Commons for second reading. This Bill was, as they no doubt knew, one to enable them to raise more capital for supplying the increasing wants of their population in Essex, and for the maintenance and improvement of their resources by constructing reservoirs at Walthamstow. The Bill was opposed by the London County Council and others, mainly upon the ground that a further supply was not really needed; that there was no hurry about the matter; that the London County Council should have still further time to consider the report of the Royal Commission; and that the Bill, which would add to the purchasing power of the Company, should not be allowed to proceed. The case of the Company was simply that the demands of Essex were emergent and imperative, as the houses were increasing at the rate of 4000 per annum; that they could not maintain permanently their constant supply without the additional works at Walthamstow; and, moreover, that the new capital would not be any material source of increased profit to the Company. An animated debate followed, with the result that the second reading was carried by the narrowest possible majority of one vote. The valuable aid they received from Essex, West Ham, and other districts affected by the Bill, greatly contributed to its successful passage through this severe ordeal. They had all along felt that, if they could only get into Committee, and thus be able to put their case clearly and fully before this tribunal, they were on such safe ground that their requisitions would be granted as fair and reasonable. These anticipations were correct. The Parliamentary Committee, with Sir Joseph Pease as Chairman, began their inquiry on the 23rd of April. The Company were opposed by the London County Council; but eventually the preamble was declared to be proved, the exigency of the works was so fully recognized that they were ordered to be carried out at once, and the terms regarding the raising of the new capital (with the annual payment to the Chamberlain of the City of London) were settled. This decision did not satisfy the London County Council; and they opposed the Company in the Lords. Here the same ground was all gone over again, with practically the same results as had been obtained by them in the House of Commons. One matter which greatly complicated and lengthened the inquiries was the question of the payment to the City Chamberlain, which he had already referred to. When the Company applied to Parliament in 1886 for further capital, the money was granted, but under the condition that the difference between the rate of issue of the new stock and what they paid in dividends and interest over the whole of the capital of the Company should, after allowing 1 per cent. for management, go to a separate fund, either for the eventual purchase of the Company's undertaking or for any purpose that Parliament might decree. This fund was to be under the City Chamberlain. Like many schemes of the kind, it seemed remarkably simple; but not only was trouble experienced in framing the clause, but doubts and difficulties arose when it came to the actual working. He might mention that, when they had a sort of friendly difference with the Chamberlain as to the way the money was to be allocated, they put their respective cases before two eminent Counsel, who, apparently without the least doubt or hesitation, gave two diametrically opposite opinions. Before the recent Committees, this already intricate question became still more complicated by those opposed to the Company desiring to add new elements of charge and *ex post facto* legislation as to the 1886 Act. After long and exhaustive inquiries, the payments to the Chamberlain, which would be heavy for the Company to bear, were settled; there were to be no retrospective enactments; and the Governor of the Bank of England was to fix such a rate of interest upon the new stock as would float it at par. The Companies had always looked upon the imposition of this funding clause as severe and inequitable; but as successive Parliamentary Committees had confirmed the principle, there was nothing to be done but, in homely language, "to grin and bear it." The Royal Assent was given to the Company's Bill on Aug. 17; and at their very next meeting, the Board instructed the Engineer to take immediate steps to carry out the works proposed. He was sorry that there had been some misapprehension as to their having had, temporarily, to revert to an intermittent supply to a portion of their district. Ill-natured and sordid motives had been wrongly attributed to them; but they could not maintain the constant service, as the rainfall last winter had not been sufficient to replenish the springs in the Lea, depleted by last summer's severe drought. But even with this severe restriction, they were giving to each person 27¾ gallons per day, or about double the quantity of water that could possibly be fairly used. Their Engineer had drawn up a short report, dated Oct. 2, on this subject, which he would read. Mr. Bryan said:—

The Company's storeage reservoirs at Walthamstow, having an area of about 226 acres, were quite full of water on the 11th of June, and practically remained so up to the 22nd of June. From this date the volume rapidly decreased; and by the 23rd of August, 540 million gallons had been taken from store. Since the 23rd of August there has been a slight increase of available water; and the period during which the water is shut off has been shortened two hours—the average time in the London district being from 9 p.m. until 6 a.m. But this shutting off only applies to the districts where great waste occurs; and there are 54,000 houses where the supplies have remained perfectly continuous. The Company's mains throughout the whole area of supply have been kept continuously charged with water for fire and other purposes; the service-pipes only being shut off.

During the period of intermittent supply to parts of the district, the volume distributed for domestic purposes, after deducting all used for trade, road-watering, flushing, fires, &c., has averaged over 27½ gallons per head per day, which is about double the domestic supply given by the Manchester, Nottingham, and other corporation water-works. All through this period the Company has availed itself of its full supply from the Thames and other sources; sufficient reserve only being kept at Walthamstow in case of accident. Even with this resort to intermittent service, the Company is giving 249 gallons per tenement daily—an amount fully equal to the average of all the Metropolitan Companies. This proves that ample supply has been, and is being, distributed. If the tenants of property would merely turn off their taps when they had drawn off what they require, the full and constant service could be immediately reverted to.

The flow of the River Lea during the whole of the present year has been much less than during 1893; but nevertheless, had the new reservoirs just sanctioned by Parliament been completed and in use, there would have been water sufficient to have filled them many times over. The causes of the diminished flow are: (1) The great drought of last year having depleted, to a very considerable extent, the springs. (2) The very deficient rainfall of last winter—from November, 1893, to March, 1894, inclusive—and the consequent non-repletion of the springs. (3) The moderate rainfall in the Lea Valley during the present year, which is still below the average; only 16¼ inches having falling at Feildes Weir up to the end of September, and practically the same amounts at High Beech and Buckhurst Hill.

There is no doubt that the heavy rainfall in July and August has given rise to much misapprehension on the subject of the curtailing of the supply within the Company's district. In those two months, 5¼ inches of rain fell; but the flow of the river over Feildes Weir diminished instead of increased as would generally be expected. None of the heavy rainfall reached the river; the evaporation and the long grass being undoubtedly the cause. Such a rainfall in the winter months would have caused a flood. In January and February, 1893, the rainfall was only 4 inches, while the flow of the River Lea was eight times as great as in July and August, 1894, although the rainfall in the two latter months was 30 per cent. greater.

Continuing, the Chairman said they would thus see that had there been cisterns, as enjoined by the Parliamentary Acts, or even a consumption approaching fairness, there would practically have been no inconvenience whatever. Last year, Parliament declined to grant the Company the means of increasing their storeage; but now that the construction of the long-contemplated new reservoirs had been sanctioned, they would before long be prepared to meet a rare contingency like the present. They recently had a meeting with some of the local sanitary authorities, and explained the circumstances of the present case to them; requesting them to help the Company in the stoppage of the tremendous waste which, they mentioned, had already attracted their serious attention. The result of the conference was satisfactory. With regard to their staff, Mr. Bryan's high reputation reached far beyond the limits of the East London Company, for which he had done

such truly valuable work. Since his tenure of office, their undertaking had made great progress. Their new engines were now of the most approved type, their water power was utilized by powerful turbines, they had a valuable supply from the chalk, and their pressure had been increased throughout. He had already mentioned how successfully their Secretary had conducted the revenue work; but they were also greatly indebted to Mr. Crookenden for the good service he recently did in the Committee-rooms, where his knowledge, perseverance, and careful preparation of all necessary details greatly contributed to the passing of their Bill. Finally, as to the prospects of next session, the London County Council had expressed their intention of introducing Bills for the purchase of this and the other Metropolitan water undertakings. The terms of these measures could not be accurately ascertained until the Bills themselves were lodged in December next. He need scarcely say that the Board would use their best endeavours to safeguard the proprietors' interests, as they had always done in the past. As far as could be gathered, there was a growing feeling that the London County Council was hardly the body to whom the water supply of London, and of the still larger districts outside, should be entrusted; and doubtless the outside authorities would have a great deal to urge in the matter, as they did when the question was considered before Sir Matthew White Ridley's Committee. He concluded by moving the adoption of the report and accounts, and the declaration of a dividend of 4 per cent. (less income-tax) on the ordinary stock of the Company, payable on the 11th inst.

Mr. H. DALTON seconded the motion.

Mr. F. BOYD BROWN referred to the onerous terms imposed on the Company by the new Act, as mentioned by the Chairman. They were, however, spoken of slightingly by many; and in spite of what was stated in the report of the Royal Commission last year respecting the purity of the water supplied by them, attacks were still made upon it, though there was not a word of truth in the allegations made about the quality of the water. With respect to the question which had arisen in regard to the legality of the charge made for fixed baths, he wished to know whether this had occurred also in connection with the East London Company. A daily paper had recently stated that, if the water supply were managed by the Corporation, there would be no charge for baths; and he desired to know whether that was so in the case of those towns where the supply was in the hands of the corporation. He thought that the time had come for the shareholders in these Companies to form a body among themselves, to protect their interests, and to resist the attacks made on them.

Mr. LOWENTHAL inquired, in connection with the question of waste, whether meters were not used by the Company.

The CHAIRMAN, in replying, stated that as long as the Government Analyst gave them the good character he did in regard to the purity of their water, it did not much matter what anyone else said. With respect to the baths, they had no trouble whatever in their district. They only charged on this account 4s. a year—or less than 1d. a week—for a house of the rateable value of £50. The better houses, too, were only charged 6s. or 8s. a year. Municipalities could charge rateably as they liked; they were not restricted, as the companies were. Meters were generally employed in connection with supplies for trade purposes. The waste that went on arose from bad fittings or the carelessness of the tenants. They did all they could to prevent this waste, which had been diminished by Mr. Bryan.

A SHAREHOLDER inquired when it was proposed to issue the new capital.

The CHAIRMAN: Directly after this meeting, the necessary sanction will be obtained.

The resolution was then put, and unanimously adopted.

On the motion of Mr. FILLITER, seconded by Mr. LOWENTHAL, Mr. George Ilsley was elected an Auditor in the place of Mr. Walter Bird, resigned.

Mr. BROWN then proposed a vote of thanks to the Chairman, Directors, and staff; and he referred in warm terms to the admirable management of the Company's affairs. He thought that 100 guineas might be voted as an honorarium to the Engineer and the Secretary; but, in any case, the best they could do was to express their thanks to those who had served them so well.

Mr. A. HOWARD seconded the motion, which was at once agreed to.

The CHAIRMAN, in acknowledging the vote, observed that they had certainly had hard work and a great deal of anxiety during the time their Bill was before Parliament; but they had a just cause, and stood on firm ground, so that they eventually obtained new capital, although under hard conditions. There were doubtless clouds on the horizon; but he thought the Company were going on their way safely and surely. As he remarked on a former occasion, they endeavoured to act up to the wise words of Lord Knutsford, when, presiding at a meeting of the Grand Junction Company, he said: "You must remember that the interests of your consumers and shareholders are identical. As long as the former are contented and satisfied, so long will the proprietors be in the same happy position."

A Special General Meeting was held subsequently, when

The CHAIRMAN proposed the following resolution: "That the debenture stock authorized by the East London Water-Works Act, 1894, to be raised, be, in exercise of the powers conferred on the Company by that Act, hereby created; and that that stock, thus created, be issued and disposed of by the Directors in such proportions, with such rights and privileges, on such terms and conditions, at such times and in such manner, consistent with the provisions of the said Act, as may by the Directors be deemed expedient from time to time."

Mr. DALTON seconded the motion.

The CHAIRMAN, in answer to questions, stated that the stock would be issued by tender, the same as the 4½ per cent. debenture stock. The Governor of the Bank of England would fix the rate at which, in his opinion, the stock would float at par—possibly 3 or 3¼ per cent.

The motion was agreed to; and the proceedings then terminated.

New Water-Works for Lynn.—The Local Government Board have granted the Lynn Town Council sanction to borrow £3600 for the purposes of purchasing land for new water-works and carrying out preliminary boring operations.

THE POSITION OF THE LEICESTER CORPORATION WATER SUPPLY.

Some very exaggerated reports regarding the water supply of Leicester have lately appeared in the London daily papers; and these have called forth a correcting statement from the Chairman of the Corporation Water Committee (Alderman E. Wood), which we have pleasure in publishing. He writes: "Our true position is that, owing to a diminished rainfall for the last three years, our reservoirs have had a severe strain placed upon them. The storeage capacity of the present Leicester reservoirs is 889 million gallons of water; and, at the average consumption of 17 gallons per head of the population (which is the quantity consumed when the service is on 24 hours per day), is capable of supplying a population of 235,000 persons. The population we have at present to supply with water is estimated to be 206,480. In the year 1890, the Corporation went to Parliament to obtain powers to acquire land and raise capital for the supply of water from another watershed, and the construction of an additional storeage reservoir, capable of holding 550 million gallons, estimated to supply a population of 100,000 persons. These works are in course of construction; and, when completed, the Corporation will have, with an average rainfall, a water supply equal to the demand of a population of over 300,000. The rainfall of this district averages 28 inches. In 1891, the rainfall was about 32 inches; in 1892, slightly under 23 inches; in 1893, slightly under 22 inches; in 1894 to the present date, about 15½ inches, of which less than 1 inch fell in September. The Corporation took steps in the autumn of last year to obtain an auxiliary supply of about 400,000 gallons per day from a spring near one of the large collieries situated about twelve miles from Leicester. This supply has been pumped into one of the storeage reservoirs since the end of December last year. In addition to this, the Engineers of the Corporation discovered some springs upon the site of the new reservoir. That water has been pumped into one of the reservoirs since May last; bringing up the auxiliary supplies of water in the dry season to about 750,000 gallons per day. The present stock in our reservoirs amounts to 109 million gallons; and although the Corporation Engineers have always felt it advisable to leave about 50 million gallons of water in each of the existing reservoirs, they, with the assent of the Medical Officer of Health, feel there would be no danger to the public health in bringing that water down a further 20 million or 30 million gallons from each reservoir. In addition to this, arrangements have been made with the owners of four of our large mills who have deep wells, the average depth of which is 175 feet; and they have consented to the Corporation taking from these wells all the water they can spare. This water is of good quality, with the exception that it is very hard. This water will be forced into the mains, and will become assimilated with the water sent down from the reservoirs, and is expected to yield 500,000 gallons per day. The Engineers of the Corporation are also sinking two deep shafts, and the quality of the water obtained from these shafts is satisfactory; and as soon as they are at sufficient depth, this water will also be available for the use of the town. We have also other sources of supply which will be utilized should the drought continue. Although there is the uttermost need of economy, and it has been my duty in my official capacity to emphasize that need, it is the opinion of our Engineers and of the Water Committee that the town will not be placed at greater inconvenience than it is at present; the water service now being from 7 a.m. to 6 p.m."

ROTHERHAM CORPORATION WATER AFFAIRS.

Resignation of the Chairman of the Committee—Proposed Improvements in the Works.

Major W. B. Hirst, the Chairman of the Water-Works Committee of the Rotherham Town Council, has resigned that position. In his letter to the Town Clerk announcing his intention of doing this, he said: "I will no longer be responsible as Chairman for the working of the most important branch in the Corporation's various undertakings under existing circumstances." A reply given by the Major, at last Wednesday's meeting of the Council, as to whether he would explain his reasons for resigning, seemed to indicate that there had been some little friction between himself and the Engineer (Mr. C. B. Newton); but he refused to enter into details. The discussion reported below, however, throws a little more light on the subject.

Mr. Newton has recently presented to the Water Committee a special report on the water supply. He states that he has thoroughly examined the Ulley conduit for leakage and its capacity to convey water; and from the tests he has made, his opinion is that the 12-inch conduit is practically sound. He believes he may safely say that the leakage does not exceed 2000 gallons per day. Theoretically, the conduit should be capable of delivering 935,000 gallons per day. But the first length (from Ulley to Whiston), by reason of its better hydraulic grade line, is superior in carrying power to the length onwards to Rotherham; and unfortunately the latter portion is expected to do more work, for, in addition, it has to take the water delivered to it by the Pinch Mill pipe. The theoretical discharge of the Ulley to Whiston pipe is about 1,079,000 gallons per day; but by actual measurement over a water-gauge, it is only capable of carrying 785,000 gallons. The full length of conduit, Ulley to Rotherham, is competent to deliver 510,000 gallons per day into the retaining-tank; and with Pinch Mill and Ulley water flowing, 550,000 gallons. Mr. Newton submits a scheme for conveying Pinch Mill water to Rotherham for the lower zone by an independent pipe. The growing district of Canklow would most probably require a reliable supply of water before long; and the scheme would provide for the wants of the place. For some months past, he has also been investigating a new source of supply, and believes it to be possible to obtain a considerable quantity of good water from the red rock in a locality free from contamination. He hopes to have an early opportunity of explaining this scheme to the Committee. He estimates the cost of his proposals as follows: Scraping conduit from Ulley, &c., £450; water supply to Canklow

from Rotherham mains, £998; 10-inch main to connect Pinch Mill water to the lower zone mains at Westgate, £3727; and new filter at Ulley and clean water basin, £1430.

Among the minutes submitted by the Water Committee or adoption at last Wednesday's meeting of the Town Council, was one recommending that Mr. Mansergh be requested to investigate the sources of water supply in the district, and report to the Committee on the whole subject, and as to the best means to be adopted to obtain a full supply of water for the borough and surrounding district. Alderman Woodhouse moved, as an amendment, that this recommendation should be struck out, as, he argued, the operations of their own Engineer had been very successful. A 2-inch borehole at Dalton had produced 200,000 gallons of water per day; and it was now proposed to bore at Guilthwaite, with the object of striking the red sandstone rock, and the cost would only amount to some £50 or £60. A second borehole at Dalton would be completed in two or three days. He urged the Council to give the Engineer fair play, as he was convinced they would then get a supply of water for a population of 70,000 persons. Mr. Hirst disputed the accuracy of the figures quoted by Alderman Woodhouse, who afterwards contended that Major Hirst had stopped the Engineer in his schemes to produce sufficient water for the town. Mr. Hirst denied this; and Alderman Woodhouse retorted that the Engineer had produced plans, but had not been allowed to explain the details to the Committee. Mr. Hickmott seconded the resolution. Mr. Cox was opposed to any more "tinkering" with the water supply of the town. There were parts of the borough where the water had been shut off for hours at a time. Mr. Newton, who was engaged for the gas-works, had admitted that he had had no experience in water-works construction; and he (Mr. Cox) therefore objected to further experiments with the ratepayers' money. Major Hirst criticized at some length the remarks of Alderman Woodhouse, and said that gentleman had hopelessly jumbled up the figures of the Engineer. He thought the town was on the verge of a water famine; and the man appointed to look after the supply had not sufficient time, because of his connection with the gas-works. He asserted that the pollutions had not been taken out of the sources of supply at Aston and Dalton. Mr. Mason did not think Major Hirst's criticisms were fair, because the gentleman concerned had not the privilege of replying. The Engineer's experiments had been successful with one exception, and for that he was not wholly responsible. From the borehole Mr. Newton had made at Dalton, they had obtained water which, if it had been bought from the Sheffield Corporation, would have cost £1000. The expense to the Corporation, however, was only £150. He thought Mr. Newton was oppressed; and he ought to have the protection of the Council. The amendment was carried by ten votes to six.

DUBLIN CORPORATION WATER UNDERTAKING.

Proposed New Reservoir—The Supply of the Out-Townships.

At the Meeting of the Municipal Council of Dublin on Monday of last week—the Right Hon. the Lord Mayor presiding—the Water Committee submitted a report recommending the Council to increase the storeage capacity for Vartry water at Roundwood, and to revise the arrangements with the out-townships.

Alderman Meade, in moving the adoption of the report, said it would be in the knowledge of the members that, in the early part of the year, the Town Commissioners of Kingstown and Dalkey proceeded for a separate supply of water by Provisional Order. The report made by the Local Government Board on that application was that, while the Board were advised that the drought of 1893 must be regarded as an unforeseen accident, they considered that, with the experience of that exceptional period before them, a serious responsibility rested upon the Corporation to take such steps as they might deem necessary to protect the inhabitants of the city and the surrounding townships against the consequences of a possible recurrence of the event, which could no longer be regarded as unforeseen. Under these circumstances, the Committee were of opinion that the Council should apply for a Provisional Order to obtain extra ground at Roundwood for the construction of an additional reservoir, and also to raise the necessary money. The second portion of the report referred to the dealings between the Corporation and the townships. Owing to defects in the Act of Parliament, several townships had taken an enormously increased supply of water over the stipulated amount of 20 gallons per head; and when the Corporation applied for payment for the extra water, they were met with a repudiation. The present position of the reservoir at Roundwood, was very different from what it was twelve months ago. In October, 1893, the water in the Roundwood reservoir was 28 35 feet below the top water level, and the contents were 318 million gallons. The water that day stood 8 inches only below the top water level; the contents being 2300 million gallons. Last year the upper reservoir at Stillorgan was 6·70 feet below top water; the lower reservoir, 6·10 feet below; and the Gray reservoir was not working. These reservoirs were now all full. The total quantity of water in store this year over and above the same date last year was 2107 million gallons. The average quantity of water that was sent over Callowhill Weir last year was from 14½ to 14¾ million gallons per day; and this year it was somewhere about 11 million gallons. This saving of 3¼ million gallons per day arose from the fact that more inspectors had been employed, and the entire plant placed under the charge of one gentleman, whose sole duty it was to look after this branch of the work; and also partly from the fright the consumers had last year. For the week ending Sept. 26, 1893, the whole of the townships consumed on an average 2,111,291 gallons per day. For the similar period of this year, they consumed an average of 2,526,813 gallons; being an increase of 415,522 gallons per day, and showing that the total saving was in the city. With regard to the second line of main, nearly nine miles had been laid between Kilcroney tank and Stillorgan, and all would have been complete, but for certain parties objecting to it going through their lands unless heavy sums were paid. Consequently the Committee had authorized a valuation to be made of all the lands for wayleave. The work so far had been carried out inside the estimates. The remaining portion of the aqueduct would have to be constructed by contract, and might be taken up with the other proposed work of increasing the storeage capacity.

Mr. Clinch seconded the motion.

The Lord Mayor, replying to a question, said it was not intended to proceed with the Lough Dan scheme.

Mr. Shanks said it was evident that at some time in the future the water supply would have to be increased; but he did not think the improved position of affairs warranted the Committee in at present contemplating an expenditure of something like £65,000.

The Lord Mayor was of opinion that the time had arrived when, as prudent people, they were bound to increase the storeage. If the townships got rid of the obligation to pay the Corporation £6000 or £7000 a year, Dublin would lose a revenue far larger than would be sufficient to provide for the interest on the £61,000 they were now asked to expend.

Mr. Thompson thought the Lord Mayor's remarks would encourage the townships to go to Parliament. He also pointed out that the Corporation had an additional supply which would be available at any moment from the Grand Canal. This matter was not promoted now by the members of the Council in the interests of the ratepayers, but for different motives; and if he had a meeting of ratepayers in the Mansion House he would say more.

This last observation of Mr. Thompson called forth some indignant protests from Alderman Meade, the Lord Mayor, and other gentlemen; and, after some display of obstinacy on his part, Mr. Thompson said he had "no hesitation in withdrawing the statement."

At the close of the discussion, the motion was carried by 35 votes to 8.

Spalding Water Company.—The annual meeting of the Spalding Water Company was held last Saturday week. The report stated that the new well at Bourne had been completed by Messrs. Isler and Co. It was driven a depth of 134 feet, and would yield a supply of 2,592,000 gallons a day, at a pressure of 10 lbs, to the square inch. The defective bore, which had been a constant source of anxiety, had been stopped up. In order to make the increased supply thus obtained available, the Directors proposed to gradually relay the main from Spalding in the direction of Bourne, and to commence the work before or in the ensuing spring. The whole expenditure at Bourne had been met from the reserve fund, which had consequently been reduced to £937. It was proposed to pay a dividend of 6 per cent., and to transfer £200 to the reserve. The report was adopted, and the dividend declared.

Sales of Shares.—At a public sale of shares at Norwich last Friday week, £20 shares in the *British Gaslight Company* were disposed of at £47 10s. and £47 15s.; £10 ordinary shares in the *Norwich Water Company* realized £17 10s.; and £10 5 per cent. preference shares in the *Great Yarmouth Water-Works Company* obtained prices ranging from £12 10s. to £12 15s.——At a sale of shares on Wednesday at Portsea, five 1868 issue shares in the *Portsmouth Water Company* changed hands at from £14 to £14 5s. each, and 32 £5 1893 issue shares (£4 paid), at from £8 10s. to £8 12s. 6d.——At Maidstone on Thursday, Messrs. Tootell and Sons sold ten £10 shares in the *Maidstone Water Company*, at £18 10s. each; two £50 shares in the *Maidstone Gas Company* at £110 each; and two £25 shares at £55 and £55 10s. respectively.——Last Wednesday Messrs. Walmsley and Sons, of Yeadon, offered for sale by auction £6000 of stock in the *Yeadon Water Company*. The stock (which is a portion of the £28,000 capital authorized by the Company's Act of 1889, and entitled to a maximum dividend of 7 per cent. per annum) was offered in £10 and £100 lots; and in nearly every instance a small premium was paid. Altogether £3710 worth was disposed of.——On Thursday, Mr. J. S. Wright, of Cleckheaton, sold 21 "A" shares in the *Gomersal Gas Company* at £8 each, and a few 10 per cent. shares at £5 16s.——In accordance with the announcement which lately appeared in our advertisement columns, Messrs. Leeder and Son offered for sale, at the Mackworth Arms Hotel, Swansea, last Friday, 400 new ordinary 7 per cent. shares (£25) in the *Swansea Gas Company*. The bidding commenced at £35 5s., and rapidly rose to £35 17s. 6d.; the next lots being sold at £35 15s. and £35 17s. 6d., £36, and £36 5s. The whole of the shares were sold; the amount realized being £14,332 10s., or an average of £35 16s. 7d. per share.

The Management of the Halifax Corporation Gas-Works.—Mr. T. Holgate, the Engineer of the Halifax Corporation Gas-Works, has prepared a report, in answer to disparaging statements which have been publicly made as to the management of the works. Mr. Holgate refers to the extensions and improvements which have been carried out since he entered on his duties at the end of December, 1888; and he claims that the condition of the works, storing, and distributing plant is very much better than six years ago. The producing power of the works has been largely increased, and that at a comparatively small cost. This development of existing works will enable the Gas Committee to defer probably for four or five years the spending of £30,000, which otherwise would have been required on the new site. West's stoking machinery, it is stated, has been a marked success. There has also been a large reduction—nearly 4 per cent.—in the amount of gas lost by leakage. Tables are given showing that the increased cost of gas manufacture has been less in Halifax than other towns. In the year ending March 31, 1892, the cost per candle power in Halifax was, for the first time, lower than any other Corporation recorded in Field's "Analysis;" and Halifax is the lowest for the year ending March 31, 1893. Halifax, too, presents a better result, with lower prices for gas, than Leeds, Bradford, and Huddersfield. At the same time the conditions of labour are more humane, the rate of pay is higher, the hours are shorter, and the regularity at work better than prevailed when Mr. Holgate began his duties. The concessions to workpeople have in this period added £3000 a year to the wages bill. It is added: "The men have learnt to recognize that the only way to secure continued employment at the Halifax Gas-Works is to do their duty, and that they can depend upon faithful service receiving its just reward of promotion." Mr. Holgate expressly says: "I cast no imputations upon either my redecessor or others."

NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

I learn that the negotiations between the Corporation of Falkirk and the Falkirk Joint-Stock Gas Company are likely to be very protracted and very costly. An endeavour was made this week to come to an agreement as to the terms of the notice, with a view to allowing the arbitration to proceed; but it proved abortive. The result is that the two litigations which have been initiated—or at all events the second one—will have to be fought out before the arbitration can begin. This is a pity, because it postpones the day when the Corporation will get the undertaking into their hands; and much money will be expended upon a matter which will not greatly benefit either of the parties. The costs of the litigation may be borne by either of them—whoever loses, in fact. It is different with the costs of the arbitration. These, by enactment and custom, are borne by the purchaser. I am amazed, therefore, that the Corporation do not take means, by peaceable methods, to come to terms with the Company, but should rather prefer a protracted fight, seeing that they will have to pay for it. The proceedings, as at present arranged, are to take place in Edinburgh; and not only have eminent Scotch Counsel been retained, but it is the intention of both parties to bring down senior Counsel from London. The Arbitrators have been appointed. They are Mr. Corbet Woodall for the Company, and Mr. E. Herbert Stevenson for the Corporation. The Oversman, I understand, has not yet been selected.

Mr. Councillor Storey, of Falkirk, the Convener of the Corporation Lighting Committee, and therefore, within the Council, the promoter of the transfer, is a man who has a good opinion of himself. Addressing a meeting of electors of Falkirk on Wednesday night, he informed his hearers that things had been stated concerning him which he had no doubt were regretted now by those who said them; and that, "although he had got some knocks, he had also given some." I suppose one of his knocks is contained in the following passage: "What had they saved by their going to Parliament? The Gas Company went to Parliament to promote a Bill for power to raise £50,000 at 8 per cent. interest; and there was further power sought to borrow £40,000 at 6 per cent., which was to go to the shareholders of the Gas Company. The total interest on the two sums would be £6400. When the Town Council took over the lighting of the burgh, they would see how improved the position would be, supposing that the works of the Gas Company were to cost them £40,000. They were told by gas experts—and the statement was also made when the case was fought in Parliament—that they could put down new works sufficient for all the requirements at a price of from £30,000 to £33,000. Allowing £40,000 for the old works, they could borrow that sum at 3 per cent. There were some people who made wild statements, and who had mentioned £80,000 as being the value of the old works; but supposing they took a wide view of the matter, and fixed a possible valuation of £60,000 at 3 per cent., this sum represented £1800, as against £6400 required by the Gas Company. There would be thus a saving of £4400 to the consumers every year. If the Council had not gone to Parliament, that sum would not have been saved; and it would have had to be raised from the consumers of gas. They were all consumers; and the saving would be quite as good, in its way, as a reduction in the rates." Now all this proceeds on the assumption that the arbitration is to be on the footing that there is no compulsory sale. That is the point which is being disputed in the Court of Session. I wonder how the Corporation can ever entertain such a notion. When they were before the House of Lords Committee, in April last, the Chairman (the Earl of Jersey) told them, when they asked him to direct the Arbiter to take into consideration "all the circumstances of the case," that Parliament had already indicated the lines on which purchase should proceed in cases of that kind; and that the purchase should take place under the Lands Clauses Act, without any explanatory words or direction. If Parliament declined to limit the Arbiter, how do they expect the Court of Session to do it? If the purchase is to be on the lines already indicated by Parliament, these lines, as followed in practice, have always been to allow for compulsory sale; and therefore, unless they aspire to set up a new order of things, they must reckon on something being added to the cost of the works on that account. It is to be borne in mind that, though the Company should have obtained their powers, they might only have exercised them, in the matter of raising capital, to the extent of one-half—just as the Corporation representatives are informing the inhabitants that they propose doing. That would cut down the annual charge to £3200. Suppose, then, that the Arbiter should now fix £60,000 as the price of the works, involving an annual charge of £1800, and should add 5 per cent. on the existing capital of the Company (which is, roundly, £50,000) for compulsory sale, the price would amount to an annual charge of £4300—a loss, according to the above supposition, of £1100 a year to the gas consumers. Of course, my position is mere hypothesis; but so is Mr. Storey's, though he does not put it forward as hypothetical.

At a meeting on Tuesday of the Edinburgh Town Council, the rival proposals with regard to the lighting of George Street and the streets and squares adjoining—by electricity and by incandescent gas-lamps—were sent to the Cleaning and Lighting Committee to be considered. The recommendation of the same Committee, that all the public lamps should burn from sunset to sunrise, to which I referred last week, was also adopted. Regarding it, Mr. Kinloch Anderson said he hoped the Committee would not lose sight of the proposal that more gas should be burned in the street-lamps, because they had not enough light in the streets. It is fashionable just now to hold up Edinburgh street lighting to scorn; and though I would not go the length of saying that the lamps are in all respects what one would like to see them, there is a consideration in the matter which is lost sight of—that is, the great width of the streets. It would be very costly to light them up in the same way as is done in some other towns. However, now that gas has been reduced in price, there should be more of it consumed. The burning of the lamps all night will take up any saving that may arise from the cheapening of the gas; and for the current year it is scarcely to be expected that there will be any proposals for increased lighting. Bailie Steel, who is Convener of the Cleaning and Lighting Committee, was able to tell the Council that the extra cost of all-night burning would be almost met by the saving from the reduced price. He also, speaking of the installation of incandescent gas lighting in Nicolson Square, said it would be some time before they would be able to report upon it, because they would require to have some experience as to the durability of the lamps, and how they stand the weather. He mentioned that the incandescent gas-lamps consumed 3·4 cubic feet of gas, and the ordinary lamps 2 cubic feet per hour, and not 1¾ cubic feet, as was stated at a recent meeting of the Council.

The little town of North Berwick, at the mouth of the Firth of Forth, made a most fortunate purchase when they took over the local Gas Company's undertaking, about two years ago. Notwithstanding that one of their first actions was to reduce the price of gas from 6s. 8d. to 5s. per 1000 cubic feet, they were able, at the close of the last financial year, to record a profit of £573. This sum was devoted to the improvement of the works. For the current year, it is estimated that there will be a surplus of £260. On account of the outlay on the works, it has been found impossible to further reduce the price of gas; but the hope is cherished that, by the working of the new plant, and with coal at a moderate figure, another reduction in price may be made. It is a pleasure to see such prosperity attending the first efforts of the Corporation. One very promising feature, and which probably accounts for much of the success attending the working of the undertaking, is the thorough harmony prevailing at the Council Board, and the entire confidence they have in their Manager.

Sheriff Spens, of Glasgow, has just decided an action which was raised in the Small Debt Court by a woman to recover £12 from the Police Commissioners as damages for injuries sustained by her on the evening of the 26th of June by falling down a dark common stair. The Sheriff has given decree against the Commissioners, holding that, by the Glasgow Police Act of 1886, they are responsible for the lighting of the stairs. This decision somewhat extends the jurisdiction of the Police Commissioners; but it is an extension which they will not be fond of contemplating. However, they took upon themselves the duty of lighting and extinguishing the lamps in common stairs, probably without considering the liability attached; but they will now be aware that duties cannot be undertaken without carrying liabilities with them.

The Act constituting Dundee a county came into force on Thursday, amid municipal rejoicing. One effect of the statute is to abolish the Gas and Water Commissions, and to merge them in the Town Council, which will now conduct those undertakings by Committees.

The Police Commissioners of Motherwell this week resolved to promote a scheme for the electric lighting of the burgh. In this they proceeded upon a report by Mr. Henry A. Mavor, of Glasgow, which dangled before them the statement (which I hope the Commissioners will live long enough to see fulfilled) that "the cost of electricity as compared with gas, for the streets alone, would only be some £10 a year more; and that the income from private lighting, after meeting that little deficiency, would go towards profit." In other places hitherto the practice has been to apply the income from private lighting to meet the cost of it; and it has not been found to be sufficient. I suppose what was meant was the profit; but it really does not much matter whether it was income or profit—it will be a long time before the £10 is wiped out. An installation is estimated to cost £12,500. I do not suppose the Commissioners would have been so precipitate in coming to the resolution they did, if it had not been for the notice which has been served upon them by a private Company, of their intention to apply for powers to light the town.

The coal strike in Scotland has suffered a great collapse this week, notwithstanding vigorous efforts by the men's leaders to keep them out. As many as 30,000 men (about half of the total) have been at work. The collapse is mostly confined to Lanarkshire, where the men were in a less perfect state of organization than they were in the other districts. In the Lothians, Fifeshire, Ayrshire, and Renfrewshire, they are firmer—comparatively few having gone back to work. It does not matter much. If those who have gone back to work continue, there will be plenty of coal for all; for it is a melancholy fact connected with the strike that hundreds of contracts have been lost to Scotch coalmasters, and therefore, until next year, there will be a very reduced demand for Scotch coal. The levies from England are this week larger than they have yet been; and, of course, there are fewer to participate, with the result that the sum per man is from 4s. to 6s. Considering the number of men at work, it is not likely that the amount of the levy will now much affect the duration of the strike.

The Hawick Town Council on Tuesday had before them a report by a Committee, which recommended that the Council should ask the Gas Company, as rent for way-leave for gas-mains, to give the town a discount of 15 instead of 7½ per cent. on the charge for gas consumed in the public lamps, and should light the two town clocks free. It was suggested that a direct rent should be charged; but, with true Border shrewdness, the Council rejected the proposal, being afraid that if they were to charge rent they might be held liable by the Gas Company for any damage which might happen to the mains. They adopted the recommendation, and under the arrangement, it was stated, the town will benefit to the amount of £40 a year.

Keighley Corporation Gas Department.—The profits of the Keighley Corporation Gas Department for the past financial year came to £8302; and after providing for interest, cost of fire brigade, public lighting, &c., the net amount stood at £3281. This it has been decided is to be divided between the sinking and reserve funds.

Electric Lighting Affairs at Bristol.—At their last meeting the Bristol Corporation Electric Lighting Committee estimated that £3250 would be required for their purposes from the next general district rate, which is £1500 less than the demand made in the past half year. The last of the engines has arrived at the central depôt, and has been installed; thus completing the plant originally proposed to be laid down. The laying of the Clifton extension will probably commence this week, and be completed by the end of the month, so that the current can be supplied by Nov. 1.

CURRENT SALES OF GAS PRODUCTS.

LIVERPOOL, *Oct.* 6.

Sulphate of Ammonia.—The market is again worse; but this seems mainly due to the preconcerted action of some dealers, as it is not an abnormally large quantity which can be said to weigh upon the market. Quotations by these dealers are lowered *daily* to suit the objects in view; and consumers naturally aid and abet these tactics to the fullest extent. It is therefore not surprising to find the market very irregular; and it is difficult to fix a value. There are said to be sellers now at £12 15s.; and a rumour has it that even £12 12s. 6d. has been accepted at Leith. Consumers are commencing to buy at these reduced prices; but in anticipation of a still lower range of values, these purchases are not extensive. Hence they have no effect upon the market. Future business has become impossible, because makers rightly now refuse to engage themselves forward; and evidently, "bear" operators do not like to run the risk of the low prices obtainable. The prospects of a rally are at the moment not very promising; but when the position is better appreciated, it may be sudden and sharp. Nitrate is rather easier.

LONDON, *Oct.* 6.

Tar Products.—Very little new business is reported in this market, with the exception of pitch, which continues in good request for prompt delivery. The other products are as dull as they well can be. Solvent naphtha is weaker in value; and carbolic acid does not improve with the autumn trade as was anticipated. New inquiries for naphthalene are being received, which may develop into important business. Business has been done during the week at the following prices: Tar, 15s. to 19s. Pitch, 35s. to 37s. 6d. Benzols, 90's, 1s. 2d.; 50's, 1s. 2d. Solvent naphtha, 1s. 3d. Toluol, 1s. 4d. Creosote, liquid, 2d.; ordinary, 1½d. Salts, 16s. Carbolic acid, 1s. 7d. Cresylic acid, 1s.; crude, 10d. Anthracene, nominal, "A," 1s. 2d.; "B," 10d.

Sulphate of Ammonia does not recover the life it showed a few months ago. On the contrary, it continues to droop, and looks like seeing lower prices still, unless makers dispose of their production more discreetly. Sales are reported at £12 17s. 6d. to £13, less 3½ per cent. Gas liquor is quoted at 9s. to 10s. 6d.

COAL TRADE REPORTS.

From Our Own Correspondents.

Lancashire Coal Trade.—The refusal of the Lancashire and Cheshire Coalowners' Association to proceed with the proposal which has emanated from the Lancashire and Cheshire Miners' Federation for establishing a local Conciliation Board, for the settlement of disputes which cannot be amicably arranged at the collieries where they arise, has been received with general regret, not only by the miners, but by the outside public—especially as previously its acceptance by the coal-owners had been regarded as almost certain. The object of the Conciliation Board was to prevent the not infrequent isolated strikes and stoppages which take place at the collieries; and it would certainly seem to have been a very sensible proposal, the non-acceptance of which by the coalowners it is very difficult to understand. With regard to the coal trade, except that in one or two cases where prices had been excessively low, there has been some slight stiffening up in the better qualities of round coal, the position remains without any very material change. Common round coals for steam and forge purposes continue in very indifferent request; whilst engine classes of fuel are more or less a drug, with extremely low figures taken to clear off surplus stocks in some instances. The better qualities of round coal are steadier. It is, however, very exceptional where best Wigan Arley is fetching more than 11s.; Pemberton four-feet and seconds Arley, 10s.; and common house coals, 8s. Steam and forge coals are readily obtainable at 7s., with some sorts quoted at 7s. 6d.; and engine fuel ranges from 3s. 6d. to 4s. for the commoner sorts of slack, and 4s. 6d. to 5s. for medium, up to 5s. 6d. and 6s. for the very best descriptions at the pit mouth. In the shipping trade, a moderate business is being done for Ireland; but inquiry from Scotland has, of course, fallen off, and prices are, if anything, a trifle easier. Common round coals, delivered at the ports on the Mersey, are readily obtainable at 8s. 6d., although some quotations go up to 9s. and 9s. 3d. per ton.

Northern Coal Trade.—There is a fuller demand for one or two kinds of coal locally, which makes up for the falling-off in the demand for Scotland, now more pronounced. The export trade in coal continues large, though the period is naturally drawing near when the Baltic shipments will be restricted by the closing of some of the ports. Best Northumbrian steam coal is still steadily in demand. The price is slightly easier, and may be now quoted as from 10s. 6d. to 10s. 9d. per ton f.o.b.; whilst second qualities are about 1s. lower, and steam smalls are 4s. 9d. per ton, though sales both above and below that price are believed to be taking place. In regard to gas coals, the deliveries are now increased under most of the contracts; but the production is adequate, and is well taken up, as exports of gas coals are heavy. The contracts for the Newcastle and Gateshead Gas Company are now being arranged. The quantity offered was far in excess of that wanted—about 185,000 tons; and the tenders were generally based on quotations that varied from 7s. to 7s. 4½d., less discount. The bulk of the coal will be bought at prices about 7s. 1½d. and 7s. 3d. per ton, less discount; so that it will be at an appreciable saving on the cost this year. The Stockton and Darlington gas coal contracts are also concluded, at prices that are not very dissimilar to those of Newcastle, when the position of the works is borne in mind. In manufacturing coals the market is fairly steady. Coke is quiet; the exports being very limited just now, and the demand being less from some other quarters—the only life being in the use for the local blast furnaces. The price generally quoted is 13s. 6d. to 14s. 6d. per ton. There is no alteration in gas coke prices this week; the larger output being still steadily taken up, so that the stocks are kept low.

Scotch Coal Trade.—There is a good deal more doing in the coal trade in Scotland, consequent upon so many of the men having gone back to work. A considerable quantity of Lanarkshire coal is being sold; and the price has come down greatly. Steam coal can be had for 8s. 9d. per ton in Glasgow; and splint for 8s. 6d. per ton. House coal is from 9s. to 10s. per ton, which a few weeks ago was selling at as high as 23s. per ton. Shipments are also improving. For the week, they amounted to 13,223 tons—an increase over the quantity in the preceding week of 3601 tons; but a decrease when compared with the corresponding week of last year of 210,295 tons. For the year to date the total shipments have been 3,794,231 tons—a decrease as compared with the corresponding period of last year of 1,806,093 tons, and as compared with the same period of 1892 of 1,918,457 tons. The decrease during the strike period has amounted to 2,167,087 tons.

The Belper Local Board and the Water-Works.—Early this year it was announced in the JOURNAL that negotiations were pending between the Belper Local Board and the Water Company for the transfer of the works of the latter body. We now learn that the Local Authority have applied to the Local Government Board for power to borrow £11,000 for the purpose of purchasing the concern. There are complaints in portions of the district as to great scarcity of water; but until an inquiry into their application has been held and sanction obtained, the Board cannot incur any expense in obtaining fresh supplies. A Committee has been appointed to investigate and report in the meantime upon the best means of procuring an additional supply.

Electric Lighting at Hampstead and Ealing.—On Monday evening last week, the electric lighting station which has been designed and carried out for the Hampstead Vestry by Mr. W. H. Preece, C.B., at an initial cost of about £28,000, was formally opened. From the central station, which is in Lithos Road, the current is conveyed to seven sub-stations; the distributing mains being so arranged that the supply of any section can be interrupted for connecting consumers' supplies without interfering with any other part of the system. For the public lighting, 22 arc lamps of 2000-candle power have been put up; and current for 1400 private lights of 8-candle power is now available—to be increased to sufficient for 3000 lights during the next few weeks. In the course of the inaugural proceedings, Mr. Preece characterized as nonsense the oft-repeated assertion that electricity is more expensive than gas; and he stated that the cost of public lighting by the two illuminants was exactly the same—viz., an average of 9s. per lamp per annum. Mr. Siemens (whose firm supplied the general plant) supported Mr. Preece's statement as to the inexpensiveness of electric lighting, and explained that the secret of economy in dwellings lay in so arranging the switches that the current might be turned on and off exactly as required. On the following Thursday, the works which Mr. C. Jones (with the assistance of Messrs. Bramwell and Harris) has carried out for the Ealing Local Board were started. The scheme, which has cost about £26,000 provides for the lighting of the principal streets, all the public buildings, the free library, and the supply of the light to private consumers. The service is on the high-pressure alternating current system, with sub-stations at which the current will be brought down from 2000 to 100 volts. The works are situated at South Ealing, and adjoin the Board's sewage works, the waste heat and water from which are to be utilized for electric lighting purposes.

Complaints as to the Water Supply at Manchester.—Recently there has been some correspondence in the Manchester papers concerning the condition of the water supplied in the southern parts of the city; and Alderman Sir John Harwood had something to say upon the matter at last Wednesday's meeting of the City Council. He said that, at certain times of the year, there had always been complaints of bad water in one quarter or another. He had known it to be bad himself in the reservoirs, and even in the watercourses; but experienced water-works men told them that the condition of water in reservoirs was subject to peculiar changes. The Committee took what remedial measures the best advice could suggest to them; but what might tend to make the water better to drink, might have the effect of spoiling it for certain trade purposes. Some 22 million gallons of water were consumed every day; 15 millions being spring water and 7 millions reservoir water. He thought it might be necessary for the Committee to filter the water which came out of the reservoirs. They did their best, and were taking the highest scientific opinions they could obtain in order to render the supply pure and good. Samples of water had been submitted to the chemical professors at Owens College; and a report on them might be expected shortly. Out of 49 complaints concerning the condition of the water received since Sept. 5, it was remarkable that only one had come from Gorton. Some discussion followed this statement, in the course of which Mr. Wilson said that since the last meeting of the Council four complaints had been made to him personally as to the condition of the water supplied to Longsight; and whether it came from the Gorton or any other reservoir, it certainly did smell, and especially during the last fortnight. Alderman Higginbottom said it appeared that, in consequence of some remarks he made in giving notice that at a future time he should move a resolution with a view to closing the bottom reservoir at Gorton, the Water Committee felt inclined to pursue the matter further. Personally, he had no objection to that, because he could produce evidence bearing out his statements as to the condition of the water. His contention was that, all through, the Gorton reservoir had been a great source of anxiety and expense. It was too shallow, it lay too low, and was too near the city. He read letters from, among other writers, Alderman King, who resides at Didsbury, to the effect that the water supplied to that district was not of good quality, and that at times it was very bad. Alderman Mark, who lives in the same locality as Alderman King, maintained, on the other hand, that at the present time there was no reasonable cause for complaint. Sir B. T. Leech stated that for some time past the districts referred to by Alderman Higginbottom had not been supplied with water from the Gorton reservoir. There was only one district having water from that source; and no complaint had been received from the consumers there. In replying to the discussion, Sir J. Harwood assured Alderman Higginbottom and the public generally that there was no ground whatever for the statements that had been made.

Tuam Gas Supply.—We learn from the *Tuam Herald* that considerable progress is being made with the new works for the supply of Tuam with gas; and it is expected that parts of the town will be provided with this source of light in the course of a few weeks. The machinery and plant have been thoroughly renovated under the superintendence of Mr. T. M. Walsh, the Manager of the works; all the most approved appliances having been adopted. Already gas-fitters are making preparations for the proper conveyance of the gas into the houses of the consumers by overhauling the service-pipes, &c. The good work done some time ago for the Kilrush Gas Company by Mr. Walsh is being repeated at Tuam; and the inhabitants of the town are looking forward to an early supply of a good and reliable illuminant—a commodity of which they have been so long deprived that they will now appreciate it at its proper worth.

Bexhill Water and Gas Company.—At the meeting of this Company last Friday week, it was announced that the net profit for the half year was £1006, as compared with £796 for the corresponding period of 1893. A dividend of 4 per cent. per annum was recommended. The Manager reported a satisfactory increase of new services for water and gas, and that the spring at Buckholt still yielded an ample supply of water. The adoption of the report having been moved by the Deputy-Chairman (Mr. R. Kersey), Mr. Plummer called attention to an amount of £2054 to the credit of the capital account which had been transferred from the profit and loss account. He desired to know how it was made up; and whether they had any authority to deal with it in this way. Mr. Kersey replied that the sum in question was an accumulation in the early period of the Company's operations, when their financial condition was not what it had since become. The Directors had been compelled to utilize this amount for the purposes of capital. After further discussion, it was agreed to adopt the report and accounts, subject to the sum referred to being retransferred to the profit and loss account, to be dealt with hereafter as advised by the Auditors.

Labour Troubles at the Rotherham Gas-Works.—The grievances of a few lamplighters and the hostile attitude of the Gas Workers' Union and the Trades and Labour Council have combined to make the position of Mr. C. B. Newton, the Engineer and Manager of the Rotherham Corporation Gas and Water Works, anything but pleasant. At the present moment, he has discontent among his men; and his Chairmen have both tendered their resignations. It appears that the requirements of the public lighting service necessitated some alteration in the rounds of the lamplighters; and they complained that extra work was put upon them without additional pay. There was a further complaint that Mr. Newton favoured non-unionists, and gave them work in preference to unionists. When an endeavour was made to arrange these matters by discussing them with the men on the works, the Chairman (Major Stoddart) was accused of calling a "hole-and-corner" meeting, and the Trades and Labour Council were greatly offended because they did not officially take part in the proceedings; and, at a meeting on the following evening, they passed a vote of censure upon both Chairman and Engineer for ignoring them. In the Gas Committee things have not been running very smoothly; and the outcome of these labour troubles has been, as already mentioned, the resignation of the Chairman of the Gas Committee, and an expression of his determination not to retain the position under any circumstances. Mr. Newton drew down upon himself the wrath of one of the labour organs, in which he was roundly charged with having "grossly mismanaged" the works, thereby causing losses which it was said had assumed "alarming proportions." Such assertions as these could not, of course, be allowed to pass unnoticed. And when the Editor's attention was called to them, and a gentle hint given to him that he might possibly be called upon to answer for them in a Court of Law, he simply withdrew every word, and offered perhaps the most abject apology ever seen in a public print.

GAS AND WATER COMPANIES' STOCK AND SHARE LIST.

(For Stock Market Intelligence, see ante, p. 690.)

Issue.	Share	When ex-Dividend.	Dividend or Div. & Bonus.	NAME.	Paid per Share	Closing Prices.	Rise or Fall in Wk.	Yield upon investment.
£			p. c.	GAS COMPANIES.				£ s. d.
590,000	10	12 Apl.	10½	Alliance & Dublin 10 p. c.	10	19—20	+⅛	5 5 0
100,000	10	"	7½	Do. 7 p.c	10	13—14	..	5 7 2
300,000	100	2 July	5	Australian (Sydney) 5 % Deb.	100	105—107	..	4 13 4
100,000	20	14 June	8	Bahia, Limited	20	11—13	..	12 6 2
200,000	5	11 May	6½	Bombay, Limited	5	6¼—6⅜	..	4 16 5
40,000	5	"	6½	Do. New	4	4⅜—5	..	5 4 0
380,000	Stck.	15 Aug.	11½	Brentford Consolidated	100	222—227	..	5 1 4
180,000	"	"	8½	Do. New	100	174—179	..	4 15 0
220,000	Stck.	28 Sept.	11	Brighton & Hove Original	100	207-212*	..	5 3 9
888,500	Stck.	30 Aug.	5	Bristol	100	114—117	..	4 5 6
320,000	20	28 Sept.	11½	British	20	48—49*	..	4 11 5
50,000	10	30 Aug.	11½	Bromley, Ordinary 10 p. c.	10	21½—22⅝	..	5 2 2
31,510	10	"	8½	Do. 7 p. c.	10	16⅝—17⅞	..	4 17 2
328,750	10	28 June	2	Buenos Ayres (New) Limited	10	7—8	..	2 10 0
200,000	100	2 July	6	Do. 6 p. c. Deb.	100	101—104	..	5 15 5
150,000	20	12 July	8	Cagliari, Limited	20	25¼—26½	..	6 0 8
550,000	Stck.	12 Apl.	13†	Commercial, Old Stock	100	270—275	..	4 14 6
165,000	"	"	10†	Do. New do.	100	200—205	..	4 17 7
160,762	"	14 June	4½	Do. 4½ p c. Deb. do.	100	132—137	..	3 5 8
800,000	Stck.	14 June	13	Continental Union Limited	100	240—245	..	5 6 1
200,000	"	"	10	Do. 7 p. c. Pref	100	210—215	..	4 13 0
535,000	Stck.	30 Aug.	5	Crystal Palace Ord. 5 p.c. Stk	100	107—112	..	4 9 3
486,090	10	27 July	11	European, Limited	10	22½—23½	..	4 13 7
354,060	10	"	11	Do. Partly paid	7½	16—17	..	4 17 1
5,646,590	Stck.	15 Aug.	12	Gaslight & Coke, A, Ordinary	100	247—250	+1	4 16 0
100,000	"	"	4	Do. B, 4 p. c. max.	100	100—104	..	3 16 11
665,000	"	"	10	Do. C, D, & E, 10 p.c. Pf.	100	277—282	..	3 10 10
30,000	"	"	5	Do. F, 5 p. c. Prf.	100	130—135	..	3 14 1
60,000	"	"	7½	Do. G, 7½ p. c. do.	100	200—205	..	3 13 2
1,300,000	"	"	7	Do. H, 7 p. c. max	100	180—185	..	3 15 8
463,000	"	"	10	Do. J, 10 p. c. Prf.	100	272—277	..	3 12 3
476,000	"	"	6	Do. K, 6 p. c. Prf.	100	165—170	..	3 10 7
1,061,150	"	14 June	4	Do. 4 p. c. Deb. Stk.	100	127—130	..	3 1 6
294,850	"	"	4½	Do. 4½ p. c. do.	100	132—137	..	3 5 8
908,000	"	"	6	Do. 6 p. c. do	100	177—182	+2	3 6 0
3,800,000	Stck.	11 May	12	Imperial Continental	100	227—232	..	5 3 5
75,000	5	14 June	6	Malta & Mediterranean, Ltd.	5	5—5⅛	..	5 9 1
560,000	100	1 Oct.	5	Met. of Melbourne, 5 p. c. Deb.	100	109-111*	+½	4 10 1
541,920	20	14 June	5	Monte Video, Limited	20	15—16	..	6 5 0
150,000	5	30 May	8	Oriental, Limited	5	7—7⅛	..	5 6 8
80,000	5	13 Sept.	7	Ottoman, Limited	5	4—4⅛	..	7 15 6
166,870	10	31 Jan.	2	Pará Limited	10	1¾—2⅛	..	8 17 9
420,000	100	2 May		People's Gas of Chicago—1st Mtg. Bds.	100	104—108	+1½	5 11 1
500,000	100	1 June	6	2nd Do.	100	98—103	+3	5 16 6
150,000	10	26 Apl.	6	San Paulo, Limited	10	9¼—9⅜	..	6 3 2
500,000	Stck.	30 Aug.	15½	South Metropolitan, A Stock	100	328—330	..	4 12 11
1,350,000	"	"	12	Do. B do.	100	277—282	..	4 5 1
260,000	"	"	13	Do. C do.	100	287—292	..	4 9 0
750,000	"	12 July	5	Do. 5 p. c. Deb. Stk.	100	156—161	..	3 2 2
60,000	Stck.	30 Aug.	11½	Tottenham & Edm'nton, "A"	100	215—220	..	5 4 7
				WATER COMPANIES.				
746,011	Stck.	28 June	10	Chelsea, Ordinary	100	285—290	..	3 9 0
1,719,514	Stck.	12 Apl.	8	East London, Ordinary	100	232—237	+2	3 7 7
654,740	"	28 June	4½	Do. 4½ p. c. Deb. Stk.	100	147—152	..	2 19 2
700,000	50	14 June	8½	Grand Junction	50	120—124	..	3 8 7
708,000	Stck.	15 Aug.	12	Kent	100	302—307	..	3 18 2
1,043,800	100	28 June	9½	Lambeth, 10 p. c. max.	100	265—270	+2	3 10 4
406,200	100	"	7½	Do. 7½ p. c. max.	100	208—211	+1	3 11 1
330,000	Stck.	28 Sept.	4	Do. 4 p. c. Deb. Stk.	100	132-135*	..	2 19 3
500,000	100	15 Aug.	12½	New River, New Shares	100	382—387	..	3 2 8
1,000,000	Stck.	27 July	4	Do. 4 p. c. Deb. Stk	100	134—137	..	2 18 4
902,300	Stck.	14 June	6	S'thwk & V'xhall, 10 p. c. max.	100	168—173	..	3 9 4
126,500	100	"	6	Do. D 7½ p. c. do.	100	150—155	..	3 17 5
1,155,066	Stck.	14 June	10	West Middlesex	100	273—278	..	3 12 9

*Ex div.

† Next dividend will be at this rate.

GWYNNE & BEALE'S

PATENT GAS EXHAUSTERS AND ENGINES.

Telegrams: "GWYNNEGRAM, LONDON." Telephone No. 2698.

GWYNNE & CO.,

HYDRAULIC AND GAS ENGINEERS,

BROOKE STREET WORKS, HOLBORN, LONDON, E.C.

Late ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON.

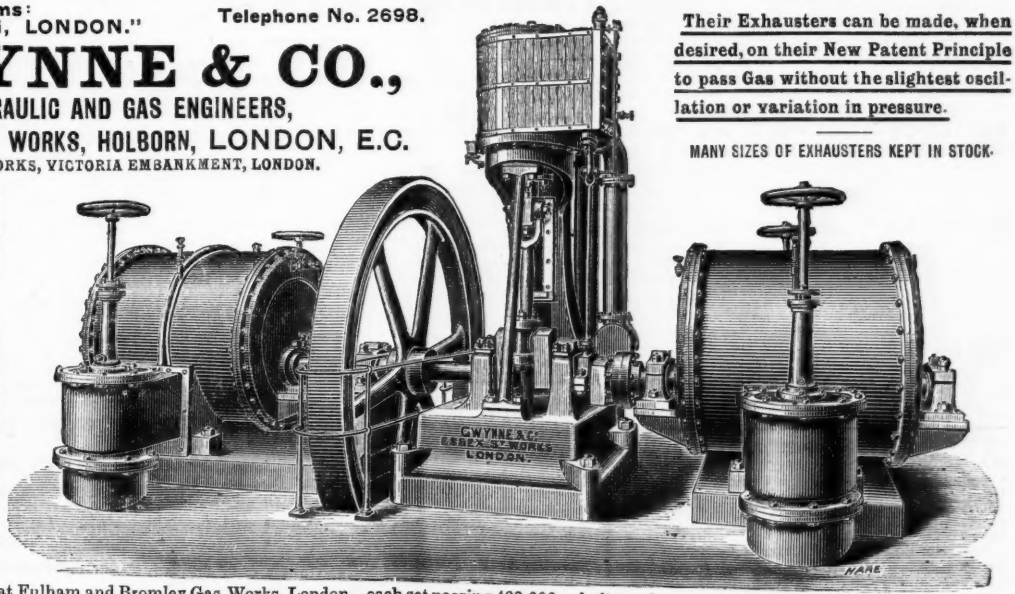
They have completed Exhausters to the extent of 32,000,000 cubic feet passed per hour, which are giving unqualified satisfaction in work.

Makers of GAS-VALVES, HYDRAULIC REGULATORS, VACUUM GOVERNORS, PATENT RETORT-LIDS, STEAM, PUMPS for Tar, Liquor, or Water; CENTRIFUGAL PUMPS and PUMPING ENGINES, specially adapted for Water-Works, raising Sewage, &c.

Also GIRARD and other TURBINES, HIGH SPEED ENGINES, DYNAMOS, &c., &c., for ELECTRIC LIGHTING.

Their Exhausters can be made, when desired, on their New Patent Principle to pass Gas without the slightest oscillation or variation in pressure.

MANY SIZES OF EXHAUSTERS KEPT IN STOCK.



Exhausting Machinery at Fulham and Bromley Gas-Works, London—each set passing 400,000 cub. ft. per hour drawing 14 miles distant from Beckton.

Catalogues and Testimonials sent on application.

NOTICE TO ADVERTISERS.—COPY FOR ADVERTISEMENTS for the "JOURNAL" should be received at the Office *not later* than TWELVE O'CLOCK NOON ON MONDAY, to ensure insertion in the following day's issue.

Orders for Alterations in, or Stoppages of PERMANENT ADVERTISEMENTS should be received not later than the FIRST POST on SATURDAY.

OXIDE OF IRON.

O'NEILL'S Oxide has a larger annual sale in the United Kingdom than all other Oxides combined. Purity and uniformity of quality guaranteed. Pamphlet, "How to Purchase Bog Ore," to be obtained on application.
Gas Purification and Chemical Company, Limited, Palmerston Buildings, Old Broad Street, London, E.C.
JOHN WM. O'NEILL, Managing Director.

GAS PURIFICATION AND CHEMICAL COMPANY, LIMITED.

ANDREW STEPHENSON, Agent. All communications re OXIDE to be addressed to PALMERSTON BUILDINGS, E.C.

WINKELMANN'S "VOLCANIC" CEMENT. Fire Resistance up to 4500° Fahr. In use in most Continental Gas-Works, and in more than 200 British Gas-Works. [See Advt., p. 719.]
ANDREW STEPHENSON, 182, Gresham House, Old Broad Street, LONDON, E.C. Telegrams: "Volcanism, London."

AMMONIACAL LIQUOR Wanted.
BROTHERTON AND Co., Ammonia Distillers. Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

GAS TAR Wanted.
BROTHERTON AND Co., Tar Distillers. Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

SPENT OXIDE Wanted.
BROTHERTON AND Co., Chemical Manufacturers. Works: BIRMINGHAM, LEEDS, and WAKEFIELD.

BROTHERTON & CO.
Offices: Commercial Buildings, LEEDS. Correspondence invited.

GOLD MEDAL, 1892.

TUBES and Fittings for Gas, Steam, and Water, in stock to 8 inches diameter; Iron and Steel Ascension-Pipes.
JOHN SPENCER, Globe Tube Works, WEDNESBURY; and 14, Great St. Thomas Apostle, LONDON.

CHARTERING, FORWARDING, AND INSURANCE.

ROBERT BRUCE FITZMAURICE, 29, Great St. Helens, London, Shipping Agent to several Gas Companies and Plant Manufacturers, would be glad to UNDERTAKE LARGE or SMALL SHIPMENTS to any Port.

HUTCHINSON BROTHERS, Gas Engineers, &c., Falcon Works, Barnsley, Makers of Wet and Dry Gas-Meters, Brass-Work, and general Gas Apparatus, Lead Saturators, Tanks, &c., Tools, and Gas-Works Sundries. (See last week, p. 669.)
Telegrams: "HUTCHINSON BROS., BARNSLEY."

REDHILL GAS-WORKS ASSESSMENT APPEAL.

THE Report of the proceedings at the hearing of the APPEAL of the REDHILL GAS COMPANY against the RATING OF THEIR PROPERTY in Reigate and Nutfield which was published in the JOURNAL has been reprinted (by desire) in Pamphlet form; and copies can be obtained, on application to the PUBLISHER, *price 4d. each.*

NOTICE OF ACCIDENTS ACT, 1894.

A CARD suitable for Exhibiting in Gas- Works, directing Officers and Workmen to REPORT to the Manager or Deputy-Manager all ACCIDENTS witnessed by them, together with the Clause of the Act specifying the notice required to be sent to the Board of Trade, has been prepared in compliance with a suggestion; and copies can be obtained, on application to the PUBLISHER of the JOURNAL, *price 4d. each, or 2s. 6d. per dozen, post free.*

AMMONIA SATURATORS.

WALTER THOMASON and SONS, Chemical Plumbers, &c., and Makers of Lead Saturators, &c., 21, WESTON STREET, BOLTON. Repairs of every description.
Please write for Estimate before ordering elsewhere.

WANTED, by a practical Man, a Situa- tion as MANAGER or FOREMAN of a Gas-Works. A thorough knowledge of the manufacture of Gas and Sulphate of Ammonia on the most approved principles.
Address No. 2426, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

WANTED, by a Competent Man, a Situation as MAIN and SERVICE LAYER, METER FIXER, INDEX READER, STOVE FIXER, and MAIN TESTER. Well up in Compo. or Iron.
Address "ALPHA," 46, Station Street, STRATFORD, E.

ADVERTISER is open to an engagement as MANAGER or ASSISTANT. Thoroughly well up in all matters relating to General Engineering, Gas, Water, Steam, Sanitary, Ventilation, and Hot-Water Work; or as TRAVELLER or AGENT for first-class Firm. Many years' experience. Highest references and testimonials.
Apply, by letter, to No. 2438, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

JAMES LAWRIE & Co. supply Best SCOTCH CANNEL COALS, Best FIRE-CLAY RETORTS, BRICKS, TILES, and LUMPS; BOILER SEATING BLOCKS, FLUE COVERS, and SILICA BRICKS for SPECIAL FURNACE WORK; COKE BARROWS, BOGIES, and SMALL WAGONS.
Postal Address: 1, WHITTINGTON AVENUE, E.C.
Telegram Address: "EIRWAL LONDON."

W. C. HOLMES & CO., Huddersfield; AND 80, CANNON STREET, LONDON, Contractors for Gas-Works complete, Makers of Gas-holders, Purifiers, Scrubbers, Condensers, Retort Fittings, &c., Improved Valves, Engines, and Exhausters. Also for Collingwood's Regenerative Retort-Settings.
*** See Advertisement p. III., centre of JOURNAL.
Cablegrams: "Ignitor London." Telegrams: "Holmes Huddersfield."

J. & J. BRADDOCK, Globe Meter Works, Oldham.
First-Class Award, Melbourne Exhibition, 1889, for WET AND DRY GAS-METERS, STATION METERS, AND GOVERNORS, PRESSURE-GAUGES, STREET LAMPS AND PILLARS, &c.
Telegraphic Address: "Braddock Oldham."

SPECIAL PAINT FOR GAS-WORKS.

JOHN E. WILLIAMS AND CO.,
VICTORIA PAINT WORKS, MANCHESTER.
Telegrams: "ENAMEL." National Telephone 1759.
GAS PLANT CEMENT
FOR ALL LEAKAGES.

PATENTS FOR INVENTIONS.

J. C. CHAPMAN, M.I.M.E. and Fel. Chartered Inst. Patent Agents. ADVICE ON ALL MATTERS CONNECTED WITH ABOVE.
Information and Handbook on application.
70, CHANCERY LANE, LONDON, W.C.

SULPHURIC ACID.

JOHN NICHOLSON & SONS, Chemical Works, Leeds, specially produce this ACID from BRIMSTONE, for making SULPHATE OF AMMONIA of high quality and *good* colour. Delivery in our own Railway Tank-Wagons or Carboys. Highest references and all particulars supplied on application.

SADLER AND CO., LIMITED, MIDDLESBROUGH; ULVERSTON (BARROW); PORTSMOUTH; CARLTON; STOCKTON; 315, St. Vincent Street, GLASGOW; and 85, Water Street, NEW YORK. Tar Distillers, Manufacturers of all TAR PRODUCTS, ALIZARINE and other TAR COLOURS, BICHROMES, OXALIC ACID, ALKALIES, LIQUOR AMMONIA, AMMONIA SULPHATE, &c.
Head Office: MIDDLESBROUGH. Correspondence invited.

HYDRATED OXIDE OF IRON.

PREPARED from pure Iron
Two or three times as rich as Bog Ore.
Strong action on Sulphuretted Hydrogen.
To be used alone, but will increase activity of other Oxides.
Less than half the price of Bog Ore.
Can be lent on hire.
Write for tabulated results.
READ HOLLIDAY AND SONS, LIMITED, HUDDERSFIELD.

ALWAYS a Buyer of Spent Oxide, Tar, and AMMONIACAL LIQUOR.
Apply to J. HARDMAN, Milton, STAFFORDSHIRE.

GAS CARBON—4-ton Loads and up- wards purchased by the BRIMINGTON CARBON COMPANY, Sowerby Bridge, YORKSHIRE.
State Price f.o.r. at nearest Station to Gas-Works.

GAS-FITTER wanted for Compo. and Iron Pipes, Cookers, Gas-Fires, Meters, &c., and to make himself generally useful.
Apply, stating wages, &c., to the GAS COMPANY, Cradley Heath, STAFFS.

WANTED, a Gentleman to introduce an AUTOMATIC TIME RECORDER amongst his connection. The Recorder would interest all Manufacturers and Employers of Labour. Payment by commission.
Apply, by letter only, with full particulars, C. D., Box 73, Sell's Advertising Agency, LONDON.

FOREMAN.

WANTED, by a large Provincial Gas Company, a thoroughly experienced practical FOREMAN of Gas-Fitters, able to direct and superintend a staff of men. Must be well up in all modern systems of Lighting and Heating by Gas, able to advise Consumers, and give Estimates for every description of Gas-Fitting Work.
Applications, stating age, experience, and wages required, together with copies of recent testimonials, to be sent to No. 2437, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

GAS PURIFICATION.

OXIDE OF IRON BOG ORE.

BALE & CO.'S Oxide of uniform quality
Sample and Price on application.
OXIDE PAINTS, OILS, SULPHURIC ACID, &c.
120 and 121, NEWGATE STREET, LONDON, E.C.
Telegrams: "BOGORE, LONDON."

OXIDE OF IRON.

FINEST Quality of Natural Bog Ore.
Particulars and price, apply to Mr. T. L. ARCHER 20, Fennel Street, MANCHESTER.

PORTER & CO., Gowts Bridge Works, LINCOLN, Engineers, Ironfounders, and Contractors for the erection of Gas-Works for, Towns, Villages, Mansions, Manufactories, Collieries, and Isolated Buildings, at home and abroad. Manufacturers of Retorts and Fittings, Condensers, Scrubbers, Purifiers, Valves, &c.; also of Girders, Wrought and Cast Iron Tanks, Iron Roofs, &c.
Telegraphic Address: "PORTER LINCOLN."

TEN-HORSE Power "Trusty" Gas- ENGINE, by Weyman, FOR SALE. Cost £220 two years ago. Will be sold for half-price, to clear at once. Guaranteed in good working order.
Apply to W. BIRCH, HIGH WYCOMBE.

SALT LAKE AND OGDEN GAS AND ELECTRIC LIGHT COMPANY, LIMITED.

THE Directors are prepared to receive TENDERS for a GASHOLDER of a capacity of 300,000 cubic feet delivered (duty free) at San Francisco or New York. The Holder is to be provided with a Steel or Iron Tank.
Tenders, accompanied with Specifications and Drawings, and stating Weight of Materials, must be lodged, before the 1st of November, with J. A. KELMAN, Secretary, 251, WINCHESTER HOUSE, E.C., from whom further Particulars may be obtained.

TENDERS FOR COAL.

THE Directors of the Sligo Gas Company invite TENDERS for the supply of 1500 to 2000 tons of large screened GAS COAL.
Delivered, on Sligo Quay (Cost, Freight, Insurance included), in lots of 300 to 400 tons as required, during the next Twelve Months.
Payments: One Month after receipt of Cargo.
Tenders, to be endorsed "Tenders for Gas Coal," to be addressed to the Chairman on or before Oct. 16, 1894.
C. B. TULLY,
Engineer and Secretary.
Gas-Works, Sligo,
Oct. 5, 1894.

GEORGETOWN (BRITISH GUIANA) GAS COMPANY, LIMITED.

NOTICE is Hereby Given, that the ORDINARY HALF-YEARLY GENERAL MEETING of the Shareholders of the above Company will be held at the Offices of the Company, 30, Gracechurch Street, in the City of London, on Tuesday, the 30th day of October, 1894, at Three o'clock in the Afternoon precisely, to receive the Directors' Report and the Accounts of the Company for the Half Year ended the 30th day of June last, to declare a Dividend, and to transact the General Business of the Company.
The Transfer Books will be closed from the 17th to the 30th of October, both inclusive.
By order of the Board,
SAMUEL WOOD,
Secretary.
Offices: 30, Gracechurch Street,
London, Oct. 2, 1894.

By order of the Directors of the Crystal Palace District Gas Company.—£15,000 Five per Cent. Debenture Stock.

MR. ALFRED RICHARDS will Sell by AUCTION, at the Mart, E.C., on Wednesday, Oct. 10, at Two o'clock, in Lots, £15,000 of FIVE PER CENT. PERPETUAL DEBENTURE STOCK of the Crystal Palace District Gas Company, to be raised in pursuance of the Crystal Palace District Gas Act, 1893, and offering to Trustees and others an Investment of the highest class.
Particulars at the OFFICES OF THE COMPANY, LOWER SYDENHAM; of the Solicitors, Messrs. BLYTH, DUTTON, HARTLEY, AND BLYTH, 122, GRESHAM HOUSE, E.C.; and of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

MICHAEL AND WILL ON GAS AND WATER.
This Day is published in One Vol., Royal 8vo., 32s. Cloth.

The Law of Gas, Water, & Electric Lighting.
Fourth Edition.
Re-written and brought down to date,
By J. SHIRESS WILL, Q.C.
London: BUTTERWORTHS, 7, FLEET STREET (Her Majesty's Law Publishers).

HARCOURT'S COLOUR TEST.
For Carbon Bisulphide, Sulphuretted Hydrogen, and Carbonic Acid in Coal Gas.
The Materials for the above Tests may be obtained from
Mr. S. E. MILLER, 115, Cowley Road, Oxford.

Just Published, in Fcap. 8vo, French Morocco, with numerous Illustrations, Price 3s.

CONSTRUCTION AND WORKING OF
REGENERATOR FURNACES.
By MAURICE GRAHAM, Assoc.M.Inst.C.E.

The *Journal of Gas Lighting* says: "This little book is an elementary explanatory treatise on the system of gaseous firing applicable to settings of horizontal or inclined retorts."
The *American Gaslight Journal* says: "The subject has been carefully covered in a style so commonsense that he who reads the book cannot fail to comprehend its teachings."
The *Gas World* says: "Mr. Graham's little book should find a place in every gas-works library."
The *Gas Engineers' Magazine* says: "The information is most valuable, not a word but what will be useful."
The *Chemical Trade Journal* says: "Neatly and strongly bound, this little work forms a most useful and handy guide to the management of gaseous fuel furnaces."
London: E. & F. N. SPON, 125, STRAND.
New York: 12, CORTLANDT STREET.

Price 2s. per dozen, or 10s. 6d. per 100, post free.

CONSPIRACY and Protection of Property Act. It is required, under a Penalty of FIVE POUNDS, that a Printed Copy of the 4th Section of this Act shall be posted up at all Gas-Works, in a conspicuous place, where the same may be conveniently read by the persons employed thereat.
Printed copies of this Section, in large type, on broad sheets, may be obtained of WALTER KING, 11, Bolt Court, FLEET STREET, E.C.

*** The Act extends to Scotland and Ireland.*

In Paper Cover, Price 1s.

GASHOLDERS
WITH OR WITHOUT
GUIDE-FRAMING.
A Discussion between E. LLOYD PEASE and F. SOUTHWELL CRIPPS.
To which is added a Synopsis of
LITERATURE ON GASHOLDER CONSTRUCTION,
Containing references to all the Literature (English and Foreign) on Reducing or Abolishing the Guide-Framing of Gasholders, also the principal Literature on Gasholder Construction generally, compiled to March, 1893; with a List of all the English and Foreign Periodicals connected with the Gas Industry.
COMPILED BY
F. SOUTHWELL CRIPPS,
Associate Member of the Institution of Civil Engineers; Fellow of the Imperial Institute; Member of the Institution of Gas Engineers; Member of the Society of Arts
AUTHOR OF
"The Guide-Framing of Gasholders and Strains in Structures Connected with Gas-Works;"
The Flow of Gases and Proportioning Gas-Mains," &c.
London:
WALTER KING, 11, Bolt Court, Fleet Street, E.C.

Price 6s., Cloth Bound,
THE CHEMISTRY OF ILLUMINATING GAS,
By
NORTON H. HUMPHRYS, Assoc. M.Inst.C.E., F.C.S.
London:
WALTER KING, 11, Bolt Court, Fleet Street, E.C.

HUNTER'S
OXIDE OF IRON.
James Hunter, Miner, and Shipper of
NATURAL IRISH BOG ORE.
This Estate yields the finest and most uniform quality in Ireland; and the quality is guaranteed.
Samples and Prices on application.
11, BAY STREET, PORT GLASGOW.
Telegrams: "Hunter, Port Glasgow."
Established 1872.

UNEQUALLED.
Gas Companies are solicited to try Samples of the
MIRFIELD
BLACK BED GAS COAL.
Prices and Analysis on application.
MIRFIELD (GAS-COAL) COLLIERY COMPY.
RAVENSTHORPE, NEAR DEWSBURY.

HOLMSIDE GAS COALS.
(Wrought out of Holmside and South Moor Collieries.)
PRESENT production 4000 tons per working day. Area of coal about 5000 acres, including the largest remaining workable proportion of pure HUTTON SEAM GAS COAL. Analysis of HOLMSIDE GAS COAL *in bulk as shipped* gives 10,500 cubic feet of Gas per ton, of an Illuminating Power of 16¼ candles. The Sulphur is about 1 per cent., and the Ash 1¾ per cent. The Coal cokes well, and leaves about 70 per cent. of excellent Coke. To show the progress of HOLMSIDE COALS, it may be mentioned that the quantity carbonized by the London Gas Companies in 1885 was about 200,000 tons; whereas the present consumption of HOLMSIDE COALS in London alone is at the rate of nearly
600,000 Tons per Annum.
Full particulars on application to
MR. MARK ARCHER,
HOLMSIDE AND SOUTH MOOR OFFICES,
NEWCASTLE-ON-TYNE.

LOW MOOR BLACK BED
GAS COAL.
YIELD OF GAS PER TON . 10,375 CUBIC FEET.
ILLUMINATING POWER . 17·50 SPERM CANDLES.
COKE . . . . . 75 PER CENT.
Prices f.o.r. or f.o.b., on application to
GEORGE & JOHN HAIGH,
RAVENS LODGE AND CONYERS' COLLIERIES,
DEWSBURY.
A TRIAL IS RESPECTFULLY SOLICITED.

COKE BREAKERS.
G. R. Mather & Son, Engineers, Wellingborough

HEATHCOTE GAS COAL.
Rich in Illuminating Power & Yield of Gas.
Above the average in Weight & Quality of Coke.
Maintains a High Standard in Residuals.
THE GRASSMOOR Co., Ld.,
CHESTERFIELD.

CAST-IRON PIPES
FOR GAS AND WATER.
Pipes, One to Six inch Bore, kept in Stock. Also a very large assortment of all sizes of Bends, T-pieces, and Specials ready for despatch on receipt of Order.
VALVES
FOR GAS, WATER, AND STEAM.
TELEGRAMS: "PIPES GLASGOW."
WM. MACLEOD & CO.,
56, ROBERTSON STREET, GLASGOW.

TROTTER, HAINES, & CORBETT,
Brettell's Estate
FIRE-CLAY & BRICK WORKS,
STOURBRIDGE.
Manufacturers of GAS-RETORTS, GLASSHOUSE FURNACE & BLAST-FURNACE BRICKS, LUMPS TILES, and every description of FIRE-BRICKS.
Proprietors of
BEST GLASSHOUSE POT & CRUCIBLE CLAY
Shipments Promptly and Carefully Executed.

LONDONDERRY GAS COALS
FROM THE
MARQUIS OF LONDONDERRY'S COLLIERIES,
COUNTY OF DURHAM.
Available output up to 5000 tons per day.
Yield of Gas 11,000 cubic feet per ton of Coal as per analysis by
Mr. John Pattinson, F.C.S., F.I.S.
For Prices and Particulars, apply to
S. J. DITCHFIELD,
SEAHAM HARBOUR, COUNTY OF DURHAM.

THOMAS TURTON AND SONS, Limited,
SHEAF WORKS, SHEFFIELD,
MANUFACTURERS OF
FILES OF BEST QUALITY
FOR ENGINEERS.
STEEL OF ALL DESCRIPTIONS.
SCREW STOCKS, TAPS AND DIES,
SPANNERS, RATCHET BRACES, LIFTING JACKS
ANVILS, VICES,
AND ENGINEERS TOOLS GENERALLY.
London Office:
90, CANNON STREET, E.C.

BOLDON GAS COALS.
Worked by THE HARTON COAL CO., LTD.
Output about 3000 tons per day.

Analysis—		
Yield of Gas per ton .	10,500	Cubic Feet.
Illuminating Power .	16·9	Candles.
Coke	66·7	Coke.
Sulphur	0·86	Sulphur.
Ash	2·04	Ash.

Boldon Gas Coals are supplied under contract to
The Gaslight and Coke Company, South Metropolitan Gas Company, Commercial Gas Company, Imperial Continental Gas Association, European Gas Company, L'Union des Gaz (the Continental Union Gas Company), Crystal Palace District Gas Company, Bombay Gas Company, Ipswich Gaslight Company, Devonport Gas Company, Sunderland Gas Company, South Shields Gas Company, and to many other Companies at Home and Abroad.
For prices, &c., apply to the
HARTON COAL COMPANY,
LIMITED,
Newcastle-on-Tyne.
W. H. PARKINSON,
FITTER.

ALEX. C. HUMPHREYS, M.E. A. G. GLASGOW, M.E.

TELEGRAPHIC ADDRESS:
"EPISTOLARY, LONDON."

HUMPHREYS & GLASGOW,

Contracting Engineers for
CARBURETTED WATER GAS PLANT,
9, Victoria Street, London, S.W.

United States Office:
64, Broadway,
New York.

COKE BREAKERS,

PRICES REDUCED.
(THOMAS & SOMERVILLE'S PATENT.)
New Design, with two Cutting Rollers, making less Breeze than their old pattern.

GEORGE WALLER & CO.,
PARK STREET, SOUTHWARK, E.C.,
And at STROUD, GLOUCESTERSHIRE.

NEWBATTLE CANNEL.

Highest Results in Gas, & Excellent Coke.

QUOTATIONS ON APPLICATION TO
THE LOTHIAN COAL COMPANY,
LIMITED,
NEWBATTLE COLLIERIES,
DALKEITH, N.B.

Awarded HIGHEST MEDAL and DIPLOMA at the Newcastle-on-Tyne Royal Mining and Industrial Exhibition, 1887, for

CANNEL & COAL

TYNE
BOGHEAD
CANNEL.

Yield of Gas per ton	13,155 cub. ft.
Illuminating Power	38·22 candles.
Coke per ton	1,301·88 lbs.

EAST PONTOP GAS COAL.

Yield of Gas per ton	10,500 cub. ft.
Illuminating Power	16·3 candles.
Coke	70 per cent.

SOUTH PELAW MAIN GAS COAL.

Yield of Gas per ton	10,500 cub. ft.
Illuminating Power	16·3 candles.
Coke	73·1 per cent.

For Prices and complete Analysis, apply to
THOS. W. DANCE & SONS,
COAL OWNERS, NEWCASTLE-ON-TYNE;
OR
E. FOSTER & CO.,
21 JOHN STREET ADELPHI, LONDON, W.C.

ROBERT MARSHALL,
CANNEL COAL MERCHANT,
97, WELLINGTON STREET, GLASGOW.

Prices and Analysis of all the Scotch Cannels on Application.

SULPHATE OF AMMONIA SATURATORS.

JOSEPH TAYLOR & CO.,
Central Plumbing Works, Town Hall Square,
BOLTON.

Practical Makers of all kinds of Saturators, and Specialists in every description of Lead Work required in connection with Sulphate Plants.

Special attention to Repairs.

Seven Saturators placed with us the present Year.

HIGHEST REFERENCES ON APPLICATION.

THE SILICA FIRE-BRICK COMPANY,

OUGHTIBRIDGE, near SHEFFIELD,
MANUFACTURE
SILICA BLOCKS, BRICKS, AND CEMENT
OF SUPERIOR QUALITY
FOR GAS-FURNACES.

Trade Mark: "SILICA."

These Goods (largely used in Gas, Glass, Iron, and Steel Works) are, on account of their
GREATER DURABILITY
Strongly recommended where EXCESSIVE HEATS have to be maintained.

T. B. KITTEL, SHEFFIELD.

CONTRACTS FOR SUPPLIES OF ANY OF THE PRINCIPAL
ENGLISH & SCOTCH CANNELS.
REAL SILKSTONE GAS COAL
ANALYSIS AND PRICES ON APPLICATION.
T. B. KITTEL, SHEFFIELD.

HEBBURN MAIN GAS COALS.

Yield of Gas per ton . . . . . 10,500 cubic feet.
Illuminating Power . . . . . 16·4 candles.
Coke . . . . . 68 per cent.

For prices, f.o.b. Ship or Delivered by Rail, apply to
THE WALLSEND & HEBBURN COAL COMPANY, LTD.
8 Lombard Street,
NEWCASTLE-ON-TYNE.
W. RICHARDSON, Fitter.

THORNLEY GAS COALS

WORKED BY THE
WEARDALE IRON AND COAL COMPANY, Ld.
OUT OF THEIR
THORNLEY AND WHEATLEY HILL COLLIERIES.

The Analysis made by Messrs. J. and H. T. Pattinson, Public Analysts for Northumberland, gives 10,500 cubic feet of Gas per ton, with an Illuminating Power of 16·3 Candles and 67·3 per cent. of Coke. The following is a Working Analysis made of these Coals by the Tudhoe and Sunderland Bridge Gas Company:—

[COPY.]
TUDHOE AND SUNDERLAND BRIDGE GAS COMPANY.
Tudhoe Gas-Works,
Spennymoor,
8th June, 1893.

Messrs. The
WEARDALE IRON & COAL COMPANY, LTD.

GENTLEMEN,

For the last two months we have used your THORNLEY GAS COAL exclusively at these gas-works; and I have pleasure in herewith giving you the actual results obtained during the trial.

Yield of Gas per ton: 10,300 cubic feet.
Yield of Coke: 13½ cwt.
Illuminating Power of Gas, average of a series of tests, 17 Sperm Candles.
The Coke was of excellent quality.
The following is a complete ultimate Analysis of the Coal.

	Per Cent.
Carbon	83·128
Hydrogen	5·116
Oxygen	7·401
Nitrogen	0·585
Sulphur	0·620
Ash	3·130
Water	0·020
	100·000

Analysis of the Coke.

Carbon	93·31
Sulphur	0·61
Ash	5·00
Moisture	1·08
	100·00

I am, Gentlemen,
Yours truly,
A. B. COWAN,
Manager.

For Price, &c., apply to the
WEARDALE IRON & COAL Co., Ld.
QUAYSIDE, NEWCASTLE-ON-TYNE.

FOR **TUBES AND FITTINGS** APPLY TO

JOHN BROTHERTON, LTD., IMPERIAL TUBE WORKS, WOLVERHAMPTON.

WILLEY & Co.,

Gas Engineering Works, Commercial Road, Exeter,

MANUFACTURERS OF EVERY DESCRIPTION OF

GAS APPARATUS.

GASHOLDERS, Telescope and Single Lift, any size. Some of the largest in the Kingdom, erected by this Firm, are giving the highest satisfaction.

PLANS and SPECIFICATIONS furnished for **Extension** and **Enlargement** of existing **Works,** adapting them to the most **Improved** and **Modern Principle** of **Gas Manufacture.**

PURIFIERS, CONDENSERS, WASHERS, ENGINES and EXHAUSTERS, STATION METERS, and GOVERNORS, manufactured and erected.

Makers, by permission of that eminent authority **MR. GEORGE LIVESEY,** of his **CELEBRATED PATENT WASHER,** highly approved by all the Engineers of Works where adopted. Largely in demand.

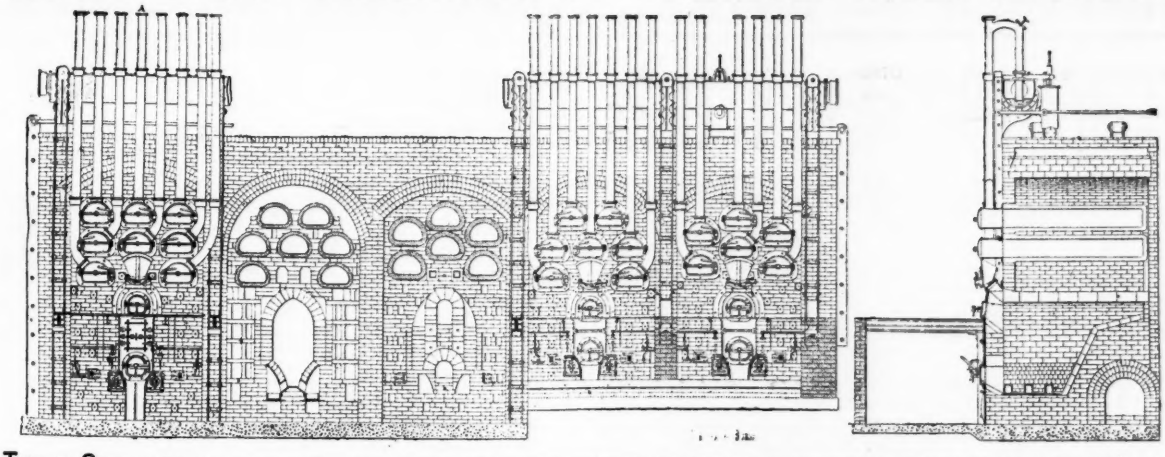
Special reference and attention are invited to our

WET AND DRY METERS,

which have acquired a high reputation for the **excellence** of Materials and Workmanship; their **durability** and **accuracy** of **Register** guaranteed. They are used by several of the **London Gas Companies,** and over **200 Provincial Gas Companies.**

Price Lists, Specifications, and Estimates provided for any work appertaining to Gas Lighting, from the Retort-House to the Drawing-Room.

HISLOP'S PATENT REGENERATIVE SETTINGS OF GAS-RETORTS.



THESE SETTINGS ARE POSITIVELY UNRIVALLED IN PRODUCTIVE CAPACITY, DURABILITY AND SIMPLICITY OF MANAGEMENT. RETORTS OF ORDINARY DIMENSIONS, CARBONIZING FROM 18 TO 24 CWT. OF ENGLISH AND 21 TO 26 CWT. OF SCOTCH COAL PER 24 HOURS, DEPENDING UPON THE NATURE OF THE COAL, AND PRODUCING UP TO FULLY 13,000 CUBIC FEET PER MOUTHPIECE IN THE SAME TIME, AND WITH THE SMALLEST EXPENDITURE OF FUEL ATTAINABLE, AND RETURNING IN PROFIT THE ENTIRE COST OF ERECTION WITHIN TWELVE TO EIGHTEEN MONTHS, AND THUS REDUCING TO INSIGNIFICANCE THE INCREASED COST OF THESE SETTINGS OVER THE COMMON OR GENERATOR FURNACE SYSTEMS.

THESE SETTINGS ARE EXTENSIVELY ADOPTED, AND ARE ERECTED UPON THE SHALLOW AND STAGE FLOOR PLANS. THEY ARE ADAPTED TO ANY EXISTING ARRANGEMENTS, AND PERFECT SATISFACTION GUARANTEED. THE COMPOSITION OF FIRE-RESISTING AND OTHER SPECIAL FIRE-CLAY MATERIALS FURNISHED IS OF THE HIGHEST ORDER; AND THE SYSTEM AS A WHOLE, AS NOW PERFECTED, IS THE RESULT OF LONG EXPERIENCE AND CAREFUL STUDY OF THE PRINCIPLES OF GASEOUS FIRING.

Drawings and Specifications are furnished for the complete erection of Ovens, with or without Retort and Bench Mountings; or complete erection undertaken if required, and carried out by specially Trained Workmen.

Further particulars may be obtained on application to the Patentee's Agents: C. M. HAMILTON, 5, Stuart Street, Shawlands, Glasgow; J. E. FISHER, Stourbridge; JOHN WALSH & SONS, Retort Builders, Halifax, Yorkshire; RICHARD TURNER, Retort Builder, Denton, Lancashire; and from the Principal Agent, R. F. HISLOP (son of Patentee), Gas-Works, Paisley, N.B.

HISLOP'S PATENT HYDRAULIC MAIN SEAL-REGULATING AND TAR-EXTRACTING VALVE is a *Sine quâ non*

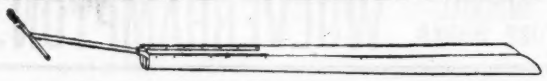
TO THE SATISFACTORY WORKING OF THE HYDRAULIC MAIN UNDER THE REGENERATIVE AS WELL AS OTHER SYSTEMS OF RETORTS. BEING LARGELY ADOPTED AND AFFORDING THE HIGHEST SATISFACTION.

SPENT LIMES NO LONGER WASTE PRODUCTS

Under G. R. HISLOP'S Patents, all Spent Limes are most effectually, economically, and continuously recovered at from one-third to one-half the cost of New Lime. The results are a surprise to all who have inspected the process, and are entirely satisfactory to all now using it.

Descriptive Pamphlets and Terms from Agents as above.

STEEL SCOOPS
FOR
RETORT CHARGING.



Scoops supplied with or without handles, and of any dimensions or shape required.

HENRY SYKES, Engineer,
66, BANKSIDE, LONDON, S.E.

HARPER & MOORES,
STOURBRIDGE.

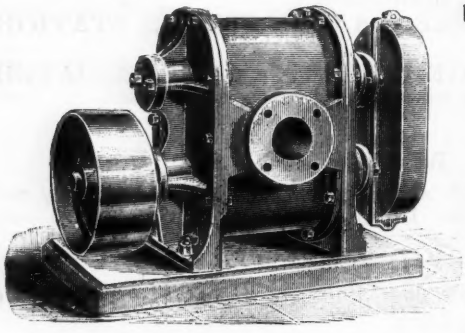
MANUFACTURERS OF
BEST FIRE-BRICKS, GAS-RETORTS,
LUMPS, TILES, AND ALL ARTICLES IN FIRE-CLAY.
Proprietors of Best Glasshouse Pot, Crucible, and other Stourbridge Clays.

MANUFACTURERS OF GLASSHOUSE POTS AND CRUCIBLES OF EVERY KIND.
ESTABLISHED 1836.

JOHNSON'S PATENT

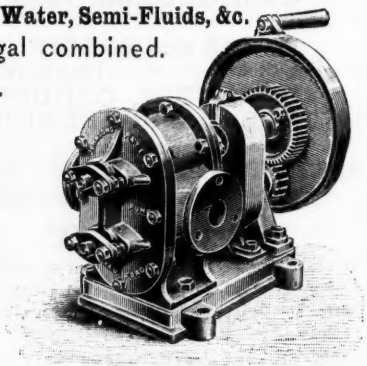
DRUM PUMP AND GAS EXHAUSTER.

The Pump of the future for quickly and economically moving large bodies of Water, Semi-Fluids, &c.
The force of the Piston Pump with the capacity of the Centrifugal combined.
NO SLIDES OR FRICTIONAL WORKING PARTS.



NO PRIMING.

NO VALVES.



As supplied to H.R.H. the Prince of Wales for Pumping Gas Liquor at his Sandringham Gas-Works.

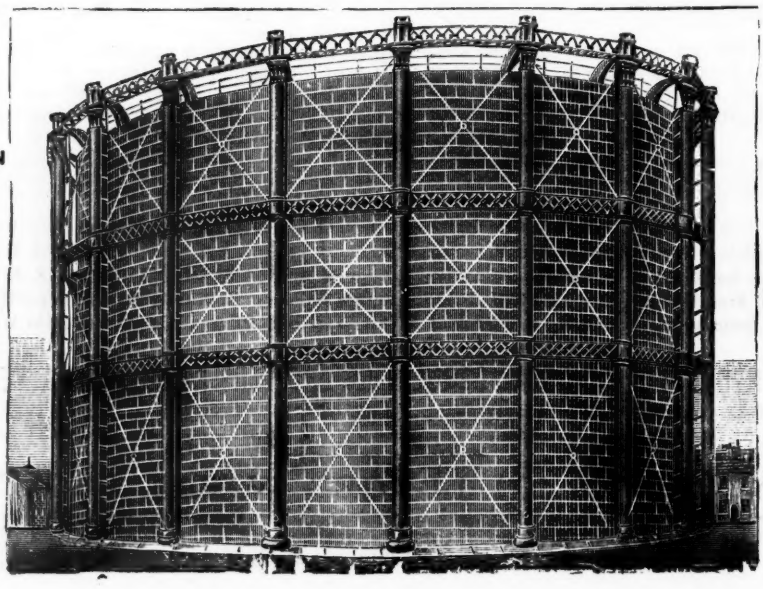
DRUM ENGINEERING COMPANY,
Hydraulic and Pneumatic Engineers, **55, ATHOL ROAD, BRADFORD.**

THE HORSELEY CO., LTD., TIPTON, STAFFORDSHIRE.

MAKERS OF **GASHOLDERS & GAS PLANT.**

PURIFIERS, SCRUBBERS, CONDENSERS, WASHERS, TANKS, VALVES, PIPES, LAMP PILLARS, RETORT-FITTINGS, ETC.

ALSO ALL KINDS OF
STRUCTURAL IRON
AND STEEL WORK,
BRIDGES
ROOFS,
PIERS, ETC.



WORKS AND HEAD OFFICE:
TIPTON,
STAFFORDSHIRE.

LONDON OFFICE:
11, VICTORIA ST.,
WESTMINSTER.

TELEGRAPHIC ADDRESSES:
"HORSELEY, TIPTON."
"GALILEO, LONDON."

BOWENS' Ltd. Successors,
STOURBRIDGE.

MANUFACTURERS OF
BEST FIRE-BRICKS; INCLINED, HORIZONTAL, and SECTIONAL RETORTS; LUMPS, TILES, &c., of every description.
Established 1860.

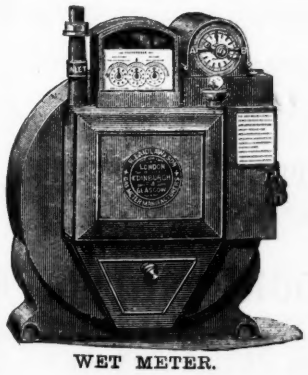
Price: Morocco, Gilt, 18s.; Cloth, 15s.; Delivered Free.
THE FIFTH EDITION OF THE
HANDBOOK
FOR
Gas Engineers and Managers,
By THOMAS NEWBIGGING, M.Inst.C.E.
London: WALTER KING, 11, Bolt Court, Fleet St., E.C.

JAMES & WILLIAM WOOD, Limited,
GAS COAL AND CANNEL CONTRACTORS AND EXPORTERS,
57, GRACECHURCH ST., LONDON, E.C.
Registered Office—28, ROYAL EXCHANGE SQUARE, GLASGOW.

CLAYTON SON & Co., LTD
MAKERS OF **LEEDS**
LARGEST GASHOLDER IN **WORLD**
ALSO THE LARGEST METAL TANK THE
See Advertisement last week, also next week
MAKERS OF RETORT-LIDS OF ALL FORMS & SHAPES BY SPECIAL HYDRAULIC MACHINERY

R. LAIDLAW & SON,
Gas-Meter Makers.

PATENT PENNY-IN-THE-SLOT
WET AND DRY
PREPAYMENT GAS-METERS.


WET METER.

Advantages claimed for our
PATENT PREPAYMENT ATTACHMENT.

1st—It is the most compact arrangement in the market.
2nd—All the working parts are mounted on a strong cast Brass Frame, the front end of which carries an additional Index and Pointer to show the number of cubic feet of Gas prepaid.
3rd—The whole attachment can be easily adapted to the ordinary Wet and Dry Meters, without interfering with any existing parts.
4th—The Patent Circular Feed Rack gives a POSITIVE quantity of Gas for each Penny, so that the money found in the cash-box will always agree with the value of Gas consumed, as shown by the ordinary index.
5th—The Patent Circular Feed Rack can be adjusted *in situ* to suit changes made in the price of Gas.

DRY METER.

EDINBURGH: SIMON SQUARE WORKS. | **GLASGOW:** ALLIANCE FOUNDRY. | **LONDON:** 6, LITTLE BUSH LANE.

THE WHESSOE FOUNDRY CO., LTD., DARLINGTON.

Established 1790.

MANUFACTURERS OF EVERY DESCRIPTION OF GAS PLANT,

FROM

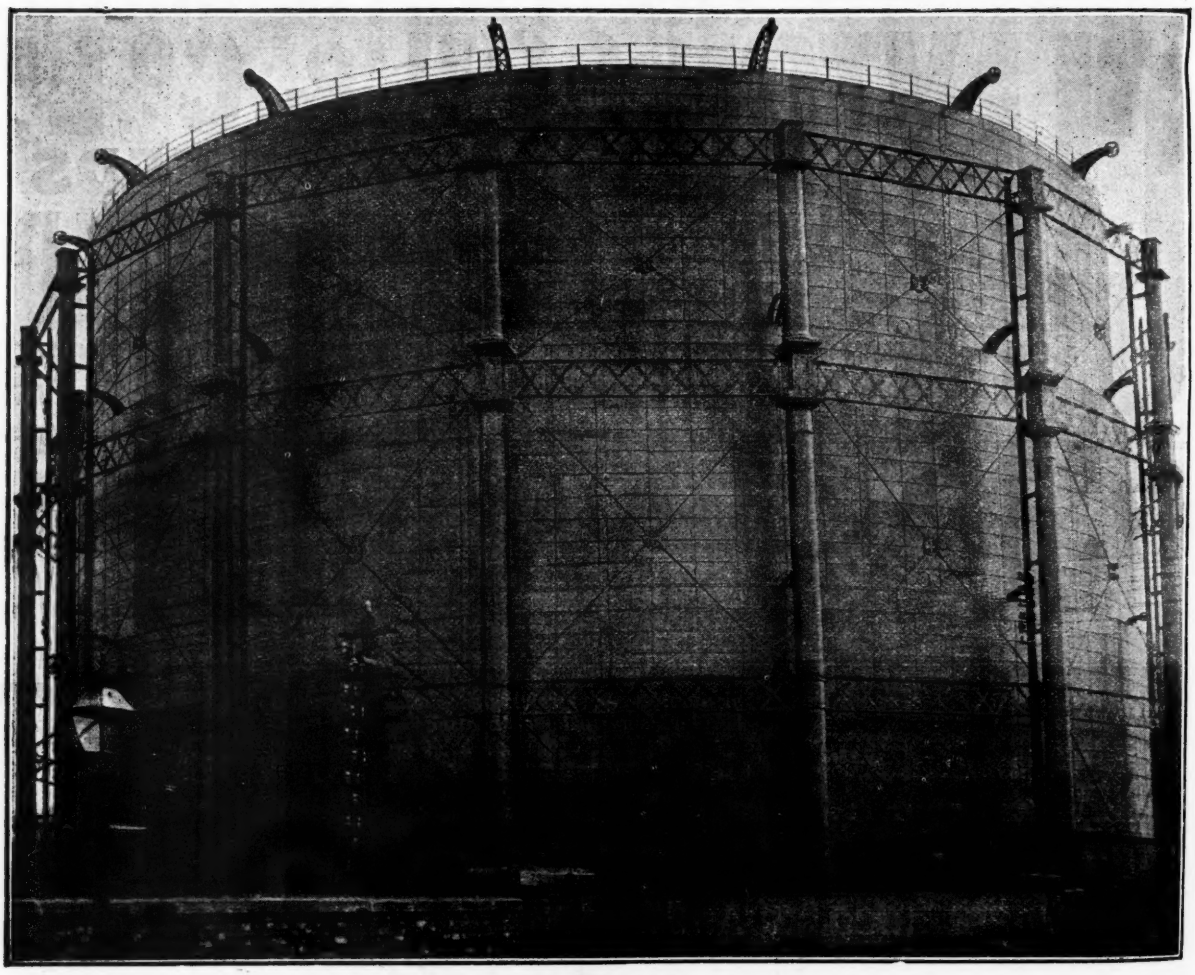
RETORTS

TO

GASHOLDERS,

FOR WHICH THEY HAVE THE NEWEST AND MOST MODERN MACHINERY.

GASHOLDERS CAN BE MADE OF ANY DIAMETER AND PUT TOGETHER AT THE WORKS.



Four-Lift Gasholder, 150 feet diameter, designed by S. Y. Shoubridge, Esq., Engineer and Manager, for the Salford Corporation Gas-Works.

Holders having a capacity of **8,000,000** Cubic Feet have been made and erected; the largest one being 181 *feet* diameter by 136 feet 9 inches deep. Riveted entirely with ⅞-inch diameter Hot Rivets.

WE ERECT GASHOLDERS EITHER WITH OR WITHOUT FRAMING.

NO ROYALTIES TO PAY FOR PATENTS.

SOLE MAKERS OF

COATES' IMPROVED PATENT FURNACE DOOR PROTECTOR

Which has been approved and adopted by the Gas Authorities at

SALFORD, MANCHESTER, BIRKENHEAD, STOCKTON, NEWCASTLE, DARLINGTON, &c.

Telegraphic Addresses: "WHESSOE, DARLINGTON." "WHESSOE, LONDON." | **T. COATES,** MANAGING DIRECTOR. | WORKS: DARLINGTON. LONDON OFFICE: 28, QUEEN STREET, E.C.

THE CONTINUOUS.

WHAT IS THE CONTINUOUS?

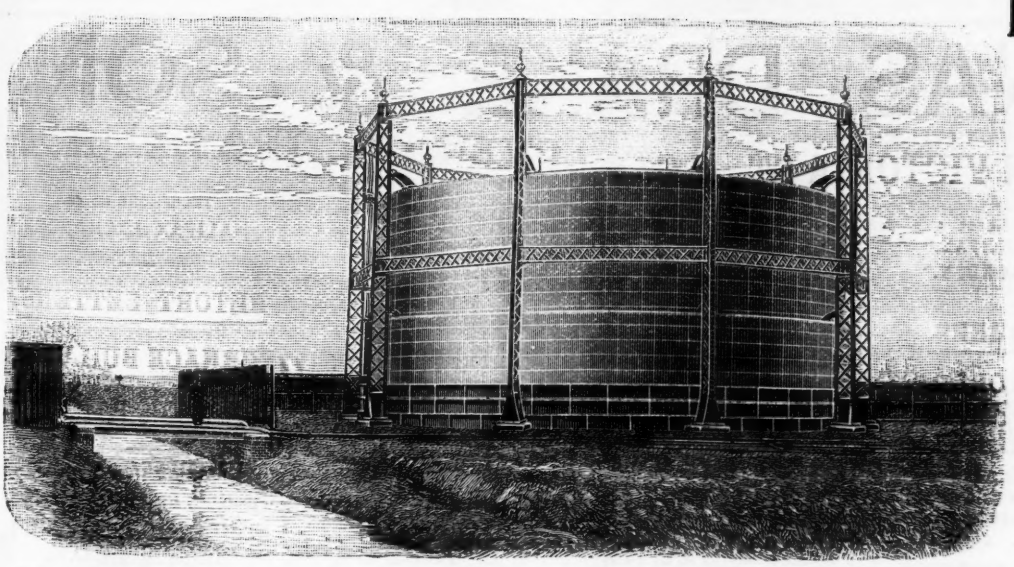
(SEE NEXT WEEK'S "JOURNAL.")

R. DEMPSTER & SONS, Ltd.,

ROSE MOUNT GAS ENGINEERING WORKS,

ESTABLISHED 1855.

ELLAND.



From a Photograph of an 80 feet Telescopic Gasholder in a Cast-Iron Tank, erected by us, with Excavation and Foundation, in 1893.

Gasholders and Tanks.

Valves.

Rotary and Reciprocating Exhausters.

Purifiers.

Scrubbers, &c., &c.

CONTRACTORS FOR EVERY DESCRIPTION OF

GAS PLANT AND CONSTRUCTIONAL IRONWORK.

ENQUIRIES SOLICITED.

GAS AND WATER PIPES.

Telegraphic Address: "RITCHIE MIDDLESBROUGH."

WILLIAM INGHAM & SONS,

Incorporated with the Leeds Fire-Clay Company, Ltd.,

WORTLEY FIRE-CLAY WORKS,
Near LEEDS,

Have confidence in drawing the special attention of GAS ENGINEERS to the following advantages of their Retorts:—

1. Smooth interior, preventing adhesion of Carbon.
2. They can be made in one piece up to 10 feet long.
3. Uniformity in thickness, ensuring equal Expansion and Contraction.

PATENT
MACHINE-MADE GAS-RETORTS.

GAS AND WATER PIPES
AND
CASTINGS OF EVERY DESCRIPTION.

MANUFACTURED BY THE

CLAY CROSS COMPANY,
CHESTERFIELD.

TRADE	TELEGRAMS:	LONDON AGENTS:
CXC	"JACKSON"	BECK & Co.,
MARK.	CLAY CROSS.	130, GT. SUFFOLK ST., S.E.

GODDARD, MASSEY, & WARNER'S
IMPROVED
Sulphate of Ammonia Apparatus.

The most successful and approved Apparatus known up to the present time.'

FOR REFERENCES, PARTICULARS, TESTIMONIALS, AND PRICES, APPLY TO

GODDARD, MASSEY, & WARNER,
ENGINEERS,
NOTTINGHAM.

The Apparatus has been supplied to the following Firms—

BURT BOULTON, & HAYWOOD, SILVERTOWN, and ELING.
CHANCE BROTHERS, OLDBURY (Four Apparatus).
RUNCORN SOAP & ALKALI CO., Limited, RUNCORN.
NETHAM CHEMICAL CO., Limited, BRISTOL.
ANIMAL CHARCOAL CO., Limited, SHADWELL.
WM. BUTLER & CO., BRISTOL.
KEMPSON & CO., Pye Bridge.

And to the following Gas Companies and Corporations—

ILKESTON.	BURY.	CHORLEY.
WIDNES.	BRIGHOUSE.	WHITEHAVEN.
HALIFAX.	MARKET HARBRO'.	CHESTER.
ALTRINCHAM.	PRESCOT.	SOUTH SHIELDS.
DENTON.	SOWERBY BRIDGE.	LEEK.
ST. ALBANS.	LEICESTER.	IPSWICH.
DUKINFIELD.	DARWEN.	BOURNEMOUTH.
NORTHWICH.	NELSON.	SALFORD.
HUDDERSFIELD.	ORMSKIRK.	LUTON.
		HAMPTON COURT.

JONAS DRAKE & SON,

LONDON OFFICE:
60, QUEEN VICTORIA ST., E.C.

OVENDEN, HALIFAX.

TELEGRAPHIC ADDRESSES:
"DRAKESON, HALIFAX."
"ECLAIRAGE, LONDON."

TELEPHONE No. 43.
HALIFAX EXCHANGE.

GAS ENGINEERS,
CONTRACTORS,
IRONFOUNDERS,

BUILDERS AND ERECTORS OF EVERY DESCRIPTION OF OVENS, BENCHES, KILNS, FURNACES, &c.

RETORT SETTERS,
FURNACE BUILDERS
ETC., ETC.

REGENERATOR AND GENERATOR FURNACES ON DRAKE'S, FRITH'S, SIEMENS'S, KLONNE'S, HASSE'S VALON'S, SOMERVILLE'S, PONSARD'S and other Principles.

INCLINED RETORTS

GASEOUS FIRING A SPECIALTY.

RETORT SETTING IN ALL ITS PRINCIPLES AND BRANCHES. BENCHES FITTED UP COMPLETE.
DRAWINGS, SPECIFICATIONS, AND ALL OTHER PARTICULARS ON APPLICATION.

STOURBRIDGE RETORTS AND FIRE-BRICKS.

BEST QUALITY.

KING BROTHERS, STOURBRIDGE.

[See Illustrated Advertisement, Oct. 2, p. 667.]

Gas-Bags for Mains. High Water Boots. Woollen Miners' Jackets.

Delivery and Suction Hose, Gutta-Percha Acid Bottles, Leather Driving Bands, Woven Canvas Hose for Fire-Engines, Wedge and Square Gas-Bags, Air and Water Beds for Invalids, Oil Tarpauling Coats, Trousers, Hats, &c., Squeegees for cleansing Pavements, &c., Billiard and Bagatelle Cush, Tricycle Tyres, Leather Hose, Cotton Waste, Engine Cloths, Oils, &c., India-rubber Waterproof Garments for Walking, Driving, or Sporting Wear, Diving and Wading Dresses, Printers' Blankets, Iron Wheels and Rollers covered with India-rubber. Stokers' Gloves, 14s. 6d. per dozen.

Write for Price List to

THOMAS BUGDEN, Manufacturer,

71, GOSWELL ROAD, LONDON, E.C.

The Climax of Regenerative Gas Lighting!!

THE

"VERTMARCHE"

A 280-CANDLE POWER

PLAIN IRON LAMP,

CLASS A— **55/-**

LIGHT for LIGHT less than half the price of any other Regenerative Lamp.

Manufactured in England.

HENRY GREENE & SONS,

153 & 155, CANNON STREET, LONDON BRIDGE, E.C.

PARTICULARS AND PRICES FREE. AGENTS WANTED.

VOLCANIC FIRE CEMENT

(WINKELMANN'S).

In Use in more than **200** British Gas-Works.

Heat Resistance, 4500° Fahr.

Directions for Use, and all Particulars, sent post free.

PACKED IN CWT. BAGS.

DEPÔTS AT LONDON, STOKE-ON-TRENT, BIRMINGHAM, MANCHESTER, and GRIMSBY.

ANDREW STEPHENSON,

182, Gresham House, Old Broad Street, LONDON, E.C.

Telegrams: "Volcanism, London."

WILSON CARTER & PEARSON,

GAS COAL AND CANNEL FACTORS,

Supply to any Railway Station, or for Export, all kinds of Fuel for Gas purposes.

ADDRESS CHIEF OFFICES:

Temple Buildings, 50, New Street, Birmingham.

THE THAMES BANK IRON CO.

UPPER GROUND STREET, LONDON, S.E.,

SUPPLY FROM STOCK

CAST-IRON RETORTS.

AND ALL KINDS OF GAS-WORKS APPARATUS.

SOCKET-PIPES FOR GAS OR WATER PURPOSES.

FLANGE PIPES FOR STEAM.

Sole Manufacturers of LYON'S 'PATENT' GAS MAIN SYPHONS.

AGENTS FOR

ATTERTON'S PATENT APPARATUS for CHARGING RETORTS.

CROWTHER BROTHERS,

Contractors for the Erection of Gas-Works Complete, RETORT-SETTINGS, Furnace Building, the Erection of Retort-Benches, &c., &c.

N.B.—Special attention given to the Erection of Inclined Retort-Benches on the Generator and Regenerative Principles complete.

MAIN LAYING IN ALL ITS BRANCHES.

For Terms and Particulars, apply to

CROWTHER BROTHERS,

152, Teviot Street, St. Leonard's Road, POPLAR, LONDON, E.

Telegraphic Address: "GASRETORT, LONDON."

Experienced Retort Setters and Main Layers sent to all Parts on the Shortest Notice.

J. & W. HORTON

ETNA WORKS,

SMETHWICK,

NEAR BIRMINGHAM

(Established 50 Years),

PATENTEES AND MANUFACTURERS OF

IMPROVED GASHOLDERS AND BOILERS

and Manufacturers of every description of

Gas Apparatus,

Cast and Wrought Iron Tanks, Purifiers, Condensers, Scrubbers, Retort-Lids, Cross-Bars and Screws, Wrought-Iron Boilers for Stationary, Portable, and Marine Engines, Sugar Pans, Coolers, Clarifiers, Punts, Boats, Bridges, Girders, Roofs, Cisterns, Oil-Tanks, Melting-Pots, Crucibles, Salt-Pans, Arch and Range Boilers, and every description of General Ironwork.

Drawings, Specifications, and Estimates supplied.

ESTABLISHED 1825.

GAS TUBES

MANUFACTURERS OF EVERY DESCRIPTION OF

IRON OR STEEL LAP-WELDED OR BUTT-WELDED TUBES

FOR ANY PURPOSE.

THE WIGAN COAL & IRON CO., LIMTD.,

Are exclusive Owners of the well-known HAIGH HALL & KIRKLESS HALL GAS COAL COLLIERIES, and supply the Best Wigan Arley Mine Gas Coal, Gas Nuts, Gas Cannel, Cannel Nuts, &c.

MIDLAND DISTRICT OFFICE: 22, TEMPLE ST., BIRMINGHAM—SOLE AGENT: A. C. SCRIVENER.

TELEGRAPHIC ADDRESS: "WIGAN BIRMINGHAM." TELEPHONE No. 200.

LONDON DISTRICT OFFICE: 6, STRAND, LONDON—C. PARKER & SON, SOLE AGENTS.

TELEGRAPHIC ADDRESS: "PARKER LONDON."

TELEGRAPHIC ADDRESS: "ROBUSTNESS, LONDON." EXCHANGE TELEPHONE 1756.

GASEOUS FIRING

FOR LARGE OR SMALL

RETORT-SETTINGS

PLANS, SPECIFICATIONS, AND ESTIMATES SUBMITTED.

SPECIALTIES

J. & H. ROBUS,

20, BUCKLERSBURY, LONDON, E.C.

ENGINEERS & CONTRACTORS

FOR THE ERECTION OF GAS AND WATER WORKS COMPLETE, AND FOR EXTENSIONS AND RENEWALS.

CLAPHAM BROTHERS, LTD.,

— ESTABLISHED 1837 —

Sole Makers of Laycock and Clapham's

PATENT "ECLIPSE" WASHER-SCRUBBER.

Constructed on a **PRINCIPLE** which has **PROVED MOST EFFICIENT**, and **NOT REQUIRED IMPROVING**, giving the **LARGEST AMOUNT OF FRESHLY WETTED SURFACE** of any machine yet introduced.

68 Machines, with a total Capacity of 76,100,000 Cubic Feet per day, have been supplied, or are in course of erection.

Last year the Manchester Corporation put in an "ECLIPSE" WASHER-SCRUBBER to pass 3,000,000 Cubic Feet per day; and this year have ordered **TWO MORE, each to pass 4,000,000 Cubic Feet per day.**

OTHER LARGE REPEAT ORDERS HAVE ALSO BEEN RECEIVED.

CLAPHAM'S IMPROVED VALVES, PURIFIERS, AND RETORT-FITTINGS; MAINS, AND GENERAL CAST AND WROUGHT IRONWORK.

CATALOGUES AND FULL PARTICULARS ON APPLICATION.

Wellington, Nelson, and Market Street Works, KEIGHLEY, YORKS.

LONDON: Printed by WALTER KING (at the Office of King, Sell, and Railton, Ltd., 12, Gough Square); and published by him at 11, Bolt Court, Fleet Street, in the City of London,—Tuesday, Oct. 9, 1894.